June 1948

TROLL SALMON TAGGING REPORT

The tagging of troll caught salmon as carried on by the Oregon Fish Commission during June, 1948, is the subject of this report.

At Astoria, the troller "Virlou" was chartered for eight days by Harry Schachter and myself to tag as many small salmon as possible. A total of 190 silvers and three chinook salmon were tagged during five days of fishing, the other three days being too rough to fish. Observations were made as to the length of the fish when it was tagged, condition, locality, etc. Stomachs and scales of the dead fish were kept and weights before and after dressing were taken.

Ray Morgan went out with the fishermen at Coos Bay and tagged thirty silvers and twenty-eight undersize chinooks. Bob Livingstone tagged twenty six silvers and three chinooks out of Newport. They also made observations on the fishing conditions, numbers of dead fish and condition and size of legal fish. A total of 281 fish were tagged in all three experiments.

Of the total of 353 fish caught on all the tagging trips, only ten or 2.8% were brought in dead. Sixty-one fish were kept by the fishermen as legal fish. Of the 281 fish tagged, 188 or 66.9% were in good condition, 52 or 18.5% in fair condition and 41 or 14.5% were in poor condition; that is they floated away.

The above data may give some idea as to the numbers of small salmon that are killed by the fishermen releasing them if undersize or out of season. Some of the fish that floated away were observed for quite a while and eventually some of them swam away. Others floated out of sight. Presuming that all the fish that were able to swim were able to survive and eliminating the sixty-one that were kept as legal size, gives 3.7% of the total fish caught as dead and 13.1% in poor condition, for a total of 16.8% not expected to live. The tagging operation would naturally be harder on a fish than just pulling out a hook, so the mortality under fishing conditions should be less. Although the fish were able to swim away, the loss of an eye or the loss of a considerable amount of blood may make them more liable to capture by predators. Considering the amazing vitality of salmon, I

believe that the maximum mortality for releasing undersize salmon should not exceed 16.8% and will probably be considerably less.

An attempt was made to correlate the condition of the fish with it's size. Nothing definite could be shown with the data at hand, but more data, especially in the extreme large and small sizes might reveal some correlation.

A list of all the tagged fish is included here. A great deal was learned of trolling gear and methods from the crew, and the problems encountered in a project of this kind were realized and studied. Of major importance was a form of live box or water compartment in the cleaning compartment of the troller, using a large piece of canvas to hold water in and keeping the tagging box down in the water. The enclosed photograph illustrates this. It worked out very well in keeping the fish in good condition and preventing the loss of too many scales. Other minor improvements, such as the use of smaller spoons and hooks were suggested and thought about and will be tried in the future.

Several other photographs taken on the trip are included as being of some interest.

Jack M. Van Hyning

Troll Salmon Tagged off the Oregon Coast

1948

Tag Number (Reedsport green)	Date	Location	Block Number	Species	Fork Length (cm.)	Condition
12	17 June	1143		S*	56	Poor*
13	"	1143		S	61	Poor
14	"	1143		C*	66	Good*
15	"	1137		S	56	Good
17	"	1143		S	58	Good
18	"	1143		S	63	Poor
19	"	1143		S	51	Fair*
20	"	1143		S	61	Good
21	"	1143		C	61	Good
22	"	1143		C	61	Good
23	"	1143		C	38	Good
24	"	1143		S	64	Good
25	"	1143		C	58	Good
26	"	1143		C	51	Fair
27	"	1143		C	58	Good
28	"	1143		S	61	Good
29	"	1149		C	61	Good
30	"	1149		S	61	Poor
31	"	1149		S	53	Poor
100	"	1149		S	51	Poor
101	"	1149		S	61	Poor
102	"	1149		S	56	Fair
103	"	1149		C	53	Good
105	"	1149		S	56	Fair
106	"	1149		S	61	Fair
107	"	1143		C	58	Good
108	"	1143		C	56	Good
109	"	1143		S	53	Poor
(Astoria Blue)						
B-601	19 June	1149		S	57	Fair
602	"	1149		S	65	Fair
603	"	1149		C	57	Good
604	"	1149		C	48	Good
605	"	1149		S	59	Good
606	"	1149		S	63	Good
607	"	1143		S	42	Poor
608	"	1143		S	55	Good
609	"	1143		S	68	Fair
610	"	1143		C	60	Poor
611	"	1143		S	70	Poor
612	22 June	1143		S	63	Poor
613	"	1143		S	63	Poor
614	"	1143		S	60	Good
615	"	1143		S	60	Fair
616	"	1143		S	61	Good
617	26 June	1143		C	63	Good
618	"	"		C	55	Good
619	"	"		C	57	Good
620	"	"		C	58	Good
621	"	"		C	58	Good

Troll Tagging (Continued)
1948

Tag Number	Date	Location	Block Number	Species	Fork Length (Cm.)	Condition
(Astoria Blue)						
622	4 July	1143		C	67	Good
623	"	"		C	51	"
625	"	"		C	55	"
626	"	1137		C	54	"
627	"	1137		C	53	"
628	"	1143		C	57	"
629	"	1137		C	49	"
630	"	1137		C	65	"
631	"	1137		?	39	"
632	"	1137		C	55	"
(Astoria C)						
1	17 June	1221		C	56	Fair
2	"	1149		C	41	Fair
3	"	1149		S	69	Poor
10	26 June	1221		S	67	Poor
11	"	"		S	70	Poor
12	"	"		S	66	Good
13	"	"		S	41	Fair
14	"	"		S	67	Fair
15	"	"		S	65	Good
16	"	"		S	62	Poor
17	"	"		S	57	Fair
18	"	"		S	67	Fair
19	"	"		S	67	Fair
20	"	"		S	62	Fair
21	"	"		S	62	Fair
22	"	"		S	67	Fair
23	"	"		S	65	Good
24	"	"		S	51	Fair
26	"	"		S	65	Fair
27	"	"		S	67	Fair
28	"	"		S	57	Fair
29	"	"		S	67	Good
30	"	"		S	70	Poor
31	"	"		S	72	Good
34	"	"		S	66	Poor
35	"	"		S	67	Fair
36	29 June	"		S	61	Fair
37	"	"		S	55	Fair
38	"	"		C	50	Fair
(Portland White A)						
400	18 June	1301		S	59	Poor
401	19 June	1250		S	62	Good
402	"	1250		S	52	Fair

Troll Tagging (Continued)

1948

Tag Number	Date	Location	Block Number	Species	Fork Lenth (cm.)	Condition
(Portland White A)						
403	18 June	1301		S	60	Poor
405	19 June	1250		S	54	Poor
406	"	"		"	66	Poor
410	"	"		"	58	Good
411	"	"		"	51	Good
412	"	"		"	60	Good
413	"	"		"	61	Poor
414	"	"		"	60	Poor
415	"	1244		"	52	Good
417	"	"		"	57	Fair
418	"	"		"	59	Poor
419	"	"		"	62	Good
420	"	"		"	60	Good
421	"	"		"	67	Fair
423	"	"		"	61	Good
425	"	"		"	63	Good
426	"	"		"	57	Good
427	"	"		"	58	Good
428	"	"		"	62	Poor
429	"	"		"	60	Good
430	"	"		"	60	Good
431	"	"		"	49	Good
432	"	"		"	64	Poor
433	"	"		"	64	Good
434	"	"		"	59	Good
435	"	"		"	67	Good
436	"	"		"	56	"
437	"	"		"	61	"
438	"	"		"	59	"
439	"	"		"	59	"
440	"	"		"	63	"
441	"	"		"	61	"
442	"	"		"	61	"
443	"	"		"	57	"
444	"	"		"	63	"
445	"	"		"	61	"
446	"	"		"	62	"
447	"	"		"	60	"
448	"	"		"	56	"
449	"	"		"	60	Fair
451	"	"		"	66	Good
452	"	"		"	56	Good
453	"	"		"	60	Good
454	"	"		"	58	"
455	"	"		"	61	"
456	"	"		"	60	Good
457	"	"		"	63	Good

Troll Tagging (Continued)

Tag Number (Portland White A)	Date	Location	Block Number	Species	Fork length (cm.)	Condition
458	19 June	1244		S	62	Good
459	"	"		"	47	"
460	"	"		"	58	Fair
461	"	"		"	58	Good
462	"	"		"	58	Fair
463	"	"		"	63	Good
464	"	"		"	56	Good
465	"	"		"	58	"
466	"	"		"	60	"
467	"	"		"	54	"
468	"	"		"	60	"
469	"	"		"	57	"
470	"	"		"	57	"
471	"	"		"	62	"
472	"	"		"	56	"
473	"	"		"	59	"
474	"	"		"	58	"
475	"	"		C	53	"
476	"	"		S	59	Fair
477	"	"		"	58	Good
478	"	"		"	66	"
479	"	"		"	56	"
480	"	"		"	61	"
481	"	"		"	62	"
482	"	"		"	63	"
483	"	"		"	59	"
484	"	"		"	59	"
485	"	"		"	56	"
486	"	"		"	61	"
487	"	"		"	58	"
488	"	"		"	59	Fair
489	"	"		"	50	"
490	"	"		"	53	Good
491	"	"		"	63	"
492	"	"		"	55	"
493	"	"		"	56	"
494	"	"		"	52	"
495	"	"		"	58	"
496	"	"		"	59	Fair
497	"	"		"	59	Poor
498	"	"		"	58	Good
499	"	"		"	64	Good
501	22 June	1250		"	?	Good
502	"	"		"	60	Good
503	"	"		"	63	Good
504	"	"		"	56	"
505	"	"		"	58	Fair
506	"	"		"	61	Good
507	"	"		"	66	Good
508	"	"		"	61	Good
509	"	"		"	59	Good

Troll Tagging (Continued)
1948

Tag Number (Portland White A)	Date	Location	Block Number	Species	Fork Length (cm.)	Condition
510	22 June	1250		S	61	Good
511	"	"		"	61	Fair
512	"	"		"	65	Good
513	"	"		"	63	Good
514	"	"		"	66	Fair
515	"	"		"	58	Good
516	"	"		"	58	Good
517	"	"		"	60	Fair
518	"	"		"	66	Good
519	"	"		"	61	Good
520	"	"		"	61	Good
521	"	"		"	57	Poor
522	"	1244		"	64	Good
523	"	"		"	59	"
524	"	"		"	67	"
525	"	"		"	62	"
526	"	"		"	64	Fair
527	"	"		"	65	Good
528	"	"		"	55	Good
529	"	"		"	64	Good
530	"	"		"	62	Poor
531	"	"		"	66	Good
532	"	"		"	62	Good
533	"	"		"	60	Good
534	"	"		"	62	Poor
535	"	"		"	63	Good
536	"	"		"	62	Poor
537	"	"		"	65	Good
538	"	"		"	64	Good
539	"	"		"	61	Good
540	"	"		"	64	Good
541	"	"		"	60	Good
542	"	"		"	53	Fair
543	"	"		"	65	Good
544	"	"		"	64	Good
545	"	"		"	64	Good
546	"	"		"	64	Fair
547	"	"		"	63	Fair
548	"	"		"	58	Fair
549	"	"		"	58	Good
550	"	"		"	62	Good
551	"	"		"	61	Good
552	"	"		"	60	Good
553	"	"		"	66	Good
554	"	"		"	61	Good
555	"	"		"	59	"
556	"	"		"	62	"
557	"	"		"	62	"
558	"	"		"	63	Good
559	"	"		"	60	Good
560	"	"		"	58	Poor
561	"	"		"	62	Good

Troll Tagging (Continued)
1948

Tag Number (Portland White A)	Date	Location Block Number	Species	Fork Length (cm.)	Condition
562	22 June	1244	S	66	Good
563	"	"	"	63	Good
564	"	"	"	55	Good
565	23 June	1238	"	61	Fair
566	"	"	"	60	Good
567	"	"	"	59	Good
568	"	"	"	55	Good
569	"	"	"	64	Good
570	"	"	"	58	Poor
571	"	"	"	60	Poor
572	"	"	"	60	Good
573	"	"	"	57	Fair
574	"	"	"	59	Poor
575	"	"	"	64	Good
576	"	"	"	55	Good
577	"	"	"	52	Good
578	"	"	"	64	Good
579	"	"	"	59	Fair
580	"	"	"	63	Good
581	"	"	"	59	Good
582	"	"	"	58	Fair
583	"	"	"	54	Good
584	"	"	"	64	Good
585	"	"	"	56	Good
586	"	"	"	62	Poor
587	"	"	"	54	Good
588	"	1244	"	56	Good
589	"	"	"	57	Good
590	"	"	"	61	Fair
591	"	"	"	65	Good
592	"	"	"	66	Good
593	"	"	"	63	"
594	"	"	"	50	Fair
595	"	"	"	62	Poor
596	"	"	"	61	Good
597	"	"	"	60	Poor
598	"	"	"	65	Poor
599	24 June	1262	C	64	Good
630	"	"	C	58	Good
638	"	1307	C	42	Good

Compiled by:

Jack M. Van Hyning

*S means Silver Salmon
*C means Chinook Salmon

Condition:

*Poor means the fish floated away after tagging belly up.
*Fair means the fish swam away very slowly, near the surface.
*Good means the fish was in good shape and swam away very quickly.

MONTHLY REPORT
SALMON TROLL INVESTIGATION
October, November, December--1948

Troll salmon fishing at the mouth of the Columbia began to taper off during the month of October. Silver fishing was fairly good during the month, with the silvers averaging 7.4 pounds in weight, but the chinooks dropped off very rapidly in numbers, and what few there were, were immature, averaging 9.3 pounds. Most of the month of October was spent in sampling the catch, with the stormy days devoted to gathering together of the summer's data and getting it into a convenient form.

November and December have been characterized by almost continuous storms, and only a few boats were fishing and they were rarely able to get out, therefore only a very few silvers were sampled and no chinooks were obtained. The silvers sampled during November average 9.04 pounds, this was a small sample and probably does not represent growth, but only a race or group of large fish that came into the fishery late in the season. The month was mostly devoted to analyzing the average weights, length-frequencies and length-weight ratios taken during the summer. This data was summarized and turned in as a progress report to the Pacific Marine Fisheries Commission. Their meeting in Seattle on November 9 and 10 was attended.

A trip was made down the coast November 15, 16, and 17 to pick up any tags, none were obtained.

A meeting of trollers was attended with Mr. Gharrett on November 22 in Astoria to explain the proposed regulations and get their comments and reactions.

A study was made of all the available literature on chinook salmon scales, in preparation for the scale reading to be done in the near future.

About a week was spent surveying some of the tributaries of the Nehalem River for the Coastal Salmon Investigation.

There has been practically no trolling during December, due to the inclement weather. The marked to unmarked ratios have been examined and are summarized here. Twelve silver marks were found out of 30,183 examined and are broken down into the following marks:

Ad.L.V. - 4,	a ratio of	1 : 7,545
Ad.R.V. - 2,	" " "	1::15,091
Ad.B.V. - 1	" " "	1 :30,182
An.L.V. - 1	" " "	1 :30,182
An.R.V. - 2	" " "	1 :15,091
D. B.V. - 1	" " "	1 :30,182
D. R.V. - 1	" " "	1 :30,182
TOTAL 12	" " "	1 : 2,515

In addition there were 43 single-fin clips seen. They were: 11 adipose, 8 L.V., 6 R.V., 7 B.V., 2 L.P., 7 R.P., 1 B.P., and 1 dorsal.

The chinook marks were as follows from 14,213 examined:

An.L.V. - 1	a ratio of	1 :14,213
An.R.V. - 3	" " "	1 : 4,738
Ad.L.V. - 6	" " "	1 : 2,369
Ad.R.V. - 1	" " "	1 :14,213
An.R.P. - 1	" " "	1 :14,213
D. R.V. - 1	" " "	1 :14,213
TOTAL 13	" " "	1 : 1,093

There were only 3 single-fin clips on the chinooks: 1 L.V., 1 R.P., and 1 B.V..

This data seems rather disappointing due to the few marks recovered in relation to the numbers of fish examined. The small number of marks recovered gives an indication of the large numbers of salmon that will have to be marked,

if a marking program is to be successful in showing migration. It is not thought possible to examine many more fish than was done this year with the same facilities and number of men.

Jack Van Hyning,

Biologist.

SALMON TROLL INVESTIGATION - MONTHLY REPORTS

January, February and March, 1949

This period has been mostly spent in an analysis of the age of troll chinook salmon by the reading of their scales. About 650 scales taken in 1948 have been read and are now being checked. Also some taken during 1946 and 1947 are being studied. A report will be forthcoming on this phase of the work.

Considerable time has also been spent on the length-weight relationship of troll silvers and chinooks. This work is summarized here.

There has been practically no trolling during this period, due to the inclement weather and lack of fish. At Depoe Bay, the first salmon was caught on March 10, but the fishing has evidently been very poor along the coast. On March 24, five chinooks were landed at Astoria, and since then trolling at the mouth of the Columbia has been fair.

The Length-Weight Relationship of Troll Chinook Salmon

During last summer's sampling, many fish were measured and weighed. Dressed weights were taken to the nearest tenth of a pound. The lengths were fork lengths to the nearest centimeter. The weights taken for each length were averaged, and when plotted on log-log paper they were found to form a straight line. This indicated the data could best be fitted by a parabolic curve of the type, $W = aL^b$ where "W" is weight, "L" is length, "a" is a constant and "b" is a power closely approximating 3. This is the formula used by all previous investigators to express the length-weight relationship of many fishes. The formula in this case was calculated to be: $W = .00001434 \times L^{3.1416}$. From the formula the curve in Figure 1 was drawn and found to fit the points very closely.

The 1947 data were also worked up, although the results are not directly comparable to the 1948 results due to the fact that total lengths were taken in 1947. Nevertheless the two years agreed very closely, the fish averaging only two tenths of a pound heavier in 1947. This is quite possibly a difference in the heaviness of the fish between the two years, as the average weights of the fish taken in 1947 also were considerably heavier than in 1948.

The length-weights taken at Coos Bay and Astoria in 1948 were compared and found to be almost identical.

Also the months of June and September were compared, and there was found to be no seasonal change in the length-weight ratios.

The Length-Weight Relationship of Troll Silver Salmon

The silver data were treated in the same manner as the chinooks, but the results were found to be very different. The silver data were found to form a straight line on both log-log and semi-log paper, although the semi-log was a better fit. The conventional length-weight formula, calculated by least squares, was $W = .00001688 \times L^{3.0808}$. However this curve did not fit the data very well. Therefore the exponential type of curve, $W = z \times 10^{bL}$, was decided upon and found to fit the points very closely. This formula was calculated to be $W = .2762 \times 10^{.0209 L}$, and Figure 2 shows the curves, the solid line being the semi-log or exponential curve and the broken line the log-log or parabolic curve. This is in conflict with all published work on the length-weight relationship of fishes, including Marr's work on silver and chum salmon of the Columbia River, in that the weight has always been considered roughly as a function of the cube of the length.

The silver data for 1947 were also examined and showed the same characteristics, although not as conspicuously. However there was a considerable difference in that the 1947 fish averaged from two tenths to a half pound heavier, for the

same length, than did the 1948 fish. This again may be a sampling or converting error, but there is a good possibility that the fish last year were actually heavier, inasmuch as the average weights were two tenths of a pound heavier in 1947 than in 1948.

The length-weight data from the three areas and different seasons were also compared and there were found to be some interesting differences, although they have not been tested for significance. Upon computing regression lines for the ratios from Astoria, Newport and Coos Bay, it appears that the fish from Coos Bay are relatively heavier than the fish from Astoria, while the Newport fish are in between. This is opposite from what Marr found in a comparison of Columbia River and British Columbia silvers, in which he concluded that the B. C. fish were relatively heavier.

The months of July, August and September were also compared and there was also found to be some difference there. The silvers taken during July were heavier than the fish taken in September, while August was in between.

These phenomena are probably tied in with the approaching sexual maturity of the silver salmon, and it is hoped that more information will be secured during this summer's work.

Jack M. Van Hyning
Aquatic Biologist
April 29, 1949

Figure One

Length-weight relationship of Troll Chinook Salmon

1-6

Parabolic Curve $W = .00001434 \times L^{3.1416}$

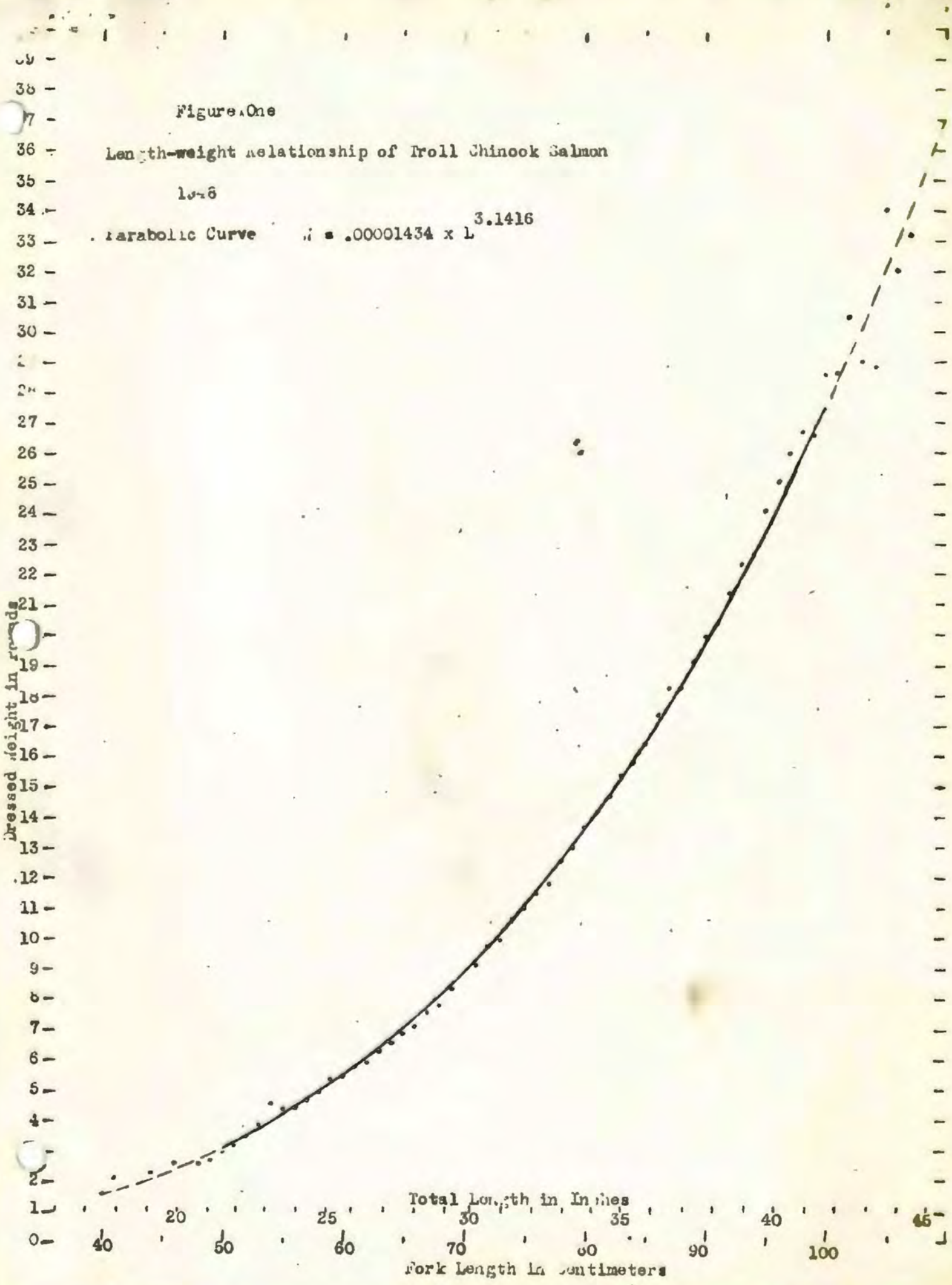


Figure [illegible]

Length-weight Relationship of Troll Silver Salmon

1948

Logarithmic Curve ——— = .[illegible] x $10^{.0209\ L}$

Parabolic Curve — — — W = .[illegible] x $L^{3.0308}$

Wt in Lbs

Total Length in Inches

[illegible]

SALMON TROLL INVESTIGATION

July and August, 1949

Tagging

With the advent of better weather and a few fish in July, the tagging program got under way. At Coos Bay and Astoria Ray Morgan, Eldon Korpela, and the author accompanied the salmon trollers and purchased salmon that were in good shape from the fishermen. The fish were measured when tagged, and the weight was calculated from the length-weight curve. The fishermen were paid accordingly, at the prevailing price per pound. One hundred sixteen salmon were tagged in this manner, 83 off the Columbia River and 33 off Coos Bay. Except for the necessity of being dependent on the fishermen and imposing on them, this method worked out quite well.

A small troller and crew (John Brooke and William Postles) were chartered for the summer at DePoe Bay. The foul weather and absence of fish in the early summer held up operations, but 201 tags were put out at DePoe Bay up to September 1. This would be the most satisfactory method of tagging if it weren't for the excessive cost which continues on even when there are no fish or the weather is too rough to fish.

A list of all tagged fish up to August 23 is included. In addition, 54 more (mostly silvers) have been tagged at DePoe Bay, but not included in this list. This brings the total to September 1 to 317 salmon tagged.

Besides tagging fish, data has been obtained on: the condition of the fish, lures used, depth taken, stomach contents, temperatures, gear selectivity, and other notes on the fishery.

One tag has been returned, a silver tagged August 6 at DePoe Bay. It was retaken 13 days later south of the Rockpile off Newport. Another small chinook tagged off Coos Bay in July, 1948 was taken off Newport in August, 1949. It had grown 9.5 centimeters, or roughly two pounds. Three California chinook tags have been recovered off the Oregon coast so far this year.

Sampling

Silver Salmon

This has been a rather unusual year for silvers. They were very scarce during June and early July, but began to appear during the last half of July, and suddenly the first of August a very large run appeared with exceptionally large fish. It was said to be the largest run in ten years off Newport, and the trollers reaped a good harvest. This helped to bring up a poor year to near normal. Figure One, a graph of the weekly average weights, shows the situation. Around the middle of July the run of large fish appeared to bring the average weights sharply up, exceeding by half a pound the previous two years at the same time. After ten days of good fishing the run dropped off (fished out?), and a new run of smaller fish apparently came in from the south. It is suggested that this year the silvers remained far offshore, feeding in the warmer water for a longer time, thus growing to a larger size before coming inshore to be taken by the trollers. The steeper slope for the 1949 line could be caused by a much faster rate of growth this year, or perhaps the movement of the larger fish in increasing numbers into the fishery could cause such a phenomena. At any rate it is quite different from the previous two years. Future sampling will tell whether this is a common or infrequent occurence.

Some more oceanographic work should be done to find more about the temperature relationship of salmon, which may lead to an answer to where the salmon are when they are not being taken by the fishery. Also, more information

on their migrations and growth should be obtained. Many of the large silvers had developed secondary sexual characteristics by the first of August, which again may be related to water temperature, and perhaps may mean an early run of silvers in some rivers.

The length-weight relationships have not been tabulated, but the silvers this year seem to be fatter and in better condition than last year.

In looking for marked silvers, 3,158 have been examined at Astoria during July and August. The following marks have been found: Adipose--5; Right Ventral--1; Left Pectoral--1; Left Ventral--1; Adipose and Left Ventral--1. At Coos Bay, 1,346 have been examined and one right ventral was found missing.

The Newport area sampling has not been completely gathered together, but it is not expected to change the picture to any extent, and will be reported upon later.

Chinook Salmon

As usual the large chinooks began to congregate off the mouth of the Columbia during August, although not in their usual numbers. They averaged 10.8 pounds at Astoria during July and 14.5 pounds during August. At Coos Bay they averaged 11.4 pounds in July and 11.2 pounds in August.

Fifteen hundred seventy-nine chinooks were examined at Coos Bay during the period and one mark was found, a left pectoral. At Astoria, 1,640 have been examined and the following marks found: Adipose--1; Adipose and Left Ventral--2; Adipose and Right Ventral--1. It will be necessary to read their scales before attempting to assign them to their respective experiments.

Numerous scale samples and length-weight relationships are constantly being taken to be studied during the winter.

Jack Van Hyning,
Aqutic Biologist.

ASTORIA TAGGING 1949

TAG NO. & DATE	SPECIES	AREA TAGGED	FORK LENGTH	CONDITION
6/24/49	Astoria series, white with blue blanks.			
C-702	Silver	1302	60 cm.	2
703	"	1302	51	2
7/1/49				
C-704	Silver	1301	61	1
705	"	1301	57	3
706	Chinook	1301	63	2
707	"	1301	70	1
708	Silver	1301	57	1
709	"	1301	63	1
710	Chinook	1301	49	1
7/6/49				
C-711	Chinook	1301	62	1
712	"	1301	65	1
713	Silver	1301	65	3
714	Chinook	1301	62	1
715	"	1301	45	3
716	Silver	1301	61	1
717	Chinook	1262	45	1
718	Silver	1301	58	?
719	Chinook	1262	66	1
721	Chinook	1301	67	1
722	"	1301	45	2
723	Chinook	1307	50	1
724	"	1307	55	1
7/7/49				
C-726	Chinook	1307	?	1
727	"	1301	62	1
728	"	1301	67	1
729	"	1301	58	1
730	Silver	1301	60	1
731	"	1301	62	2
732	Chinook	1301	41	1
733	Silver	1301	60	2
734	Chinook	1301	65	1
735	Silver	1301	63	1
736	Chinook	1301	54	3
7/13/49				
C-737	Chinook	1301	57 cm.	3
738	Silver	1301	61	3
739	Chinook	1301	44	1
740	Silver	1262	59	2
741	Silver	1262	51	1
742	Chinook	1262	69	3
7/14/49				
C-743	Chinook	1262	48	1
744	Silver	1256	58	3
746	Chinook	1256	58	1
7/15/49				
C-745	Silver	1262	57	2
747	Silver	1262	54	1
748	Chinook	1262	69	1
749	"	1262	44	1
750	Sthd	1301	70	1
7/21/49				
C-753	Silver	1301	62	2
754	Silver	1301	65	2
755	"	1301	51	1
756	Chinook	1301	45	3
757	"	1301	52	1
758	Silver	1256	65	3
7/22/49				
C-760	Chinook	1307	42	1
761	Silver	1307	65	2
762	"	1307	52	1
763	Chinook	1307	44	1
764	Silver	1307	?	3
765	Chinook	1307	42	3
766	"	1307	41	1
767	Silver	1307	55	3
768	Chinook	1307	37	2
769	"	1307	36	1
770	"	1307	51	1
771	"	1307	41	1

TAG NO. & DATE	SPECIES	AREA TAGGED	FORK LENGTH	CONDITION
7/28/49	Astoria series, white with blue blanks.			
C-773	Chinook	1307	59 cm.	1
774	"	1307	50	1
775	"	1307	44	3
776	"	1307	58	3
777	"	1307	43	1
778	"	1307	54	1
779	Silver	1307	69	2
780	"	1307	68	2
781	Chinook	1307	51	1
782	Silver	1307	64	3
783	"	1307	66	1
8/5/49				
C-785	Chinook	1307	54	1
786	"	1307	49	1
787	"	1307	52	1
788	"	1307	39	1
789	"	1307	51	2
790	"	1307	47	3
8/7/49	"P" series.			
P-212	Chinook	1307	?	1

DEPOE BAY TAGGING 1949

7/3/49	Astoria series, white with white blanks.			
C-74	Silver	1226	52	1
76	"	1226	68	1
77	"	1226	69	1
7/4/49				
C-78	Silver	1226	54	3
79	Chinook	1226	52	1
7/21/49				
C-80	Silver	1226	67	1
82	"	1221	72	1
83	"	1221	70	1
7/22/49				
C-84	Chinook	1221	47	1
85	Silver	1221	59	1
86	"	1221	54	2
87	"	1221	64	1

TAG NO. & DATE	SPECIES	AREA TAGGED	FORK LENGTH	CONDITION
7/27/49				
C-88	Silver	1221	64 cm.	1
89	"	1221	72	1
90	"	1221	73	3
91	"	1221	70	3
92	"	1221	73	1
93	"	1221	52	1
94	"	1221	77	1
95	"	1221	65	1
96	"	1221	59	1
97	"	1221	57	1
8/4/49				
C-98	Silver	1221	55	1
99	"	1221	67	1
101	"	1221	65	1
102	"	1221	66	1
103	"	1221	74	1
104	"	1221	71	1
105	"	1221	68	1
106	"	1221	58	3
107	"	1221	74	1
8/5/49				
C-109	Silver	1221	72	1
110	"	1221	68	3
111	"	1221	71	1
112	"	1221	54	1
113	"	1221	63	1
114	"	1221	64	1
115	"	1221	67	1
116	"	1221	64	1
117	"	1221	65	1
118	"	1221	64	1
119	"	1221	64	1
120	"	1221	58	1
121	"	1221	72	1
124	"	1221	67	1
125	"	1221	56	1

TAG NO. & DATE	SPECIES	AREA TAGGED	FORK LENGTH	CONDITION
8/6/49	DePoe Bay Tagging Cont. Astoria series, white with white blanks.			
C-122	Silver	1221	69 cm.	1
123	"	1221	66	1
126	"	1221	63	1
127	"	1221	64	1
128	"	1221	68	1
129	"	1221	57	3
130	"	1221	72	1
132	"	1221	65	3
133	Chinook	1221	43	2
134	Silver	1221	65	2
135	"	1221	70	1
136	"	1221	70	1
137	"	1221	60	2
138	"	1221	68	2
139	"	1221	64	1
140	"	1221	65	1
142	"	1221	63	3
143	"	1221	66	1
144	"	1221	64	3
131	"	1221	77	1
8/7/49				
C-145	Silver	1221	78	3
8/12/49				
C-146	Silver	1221	49	2
147	"	1221	66	2
148	"	1221	59	1
149	"	1226	61	1
150	"	1226	72	1
151	"	1226	66	2
152	"	1226	68	1
153	Chinook	1226	46	2
154	Silver	1226	69	3
155	"	1226	65	1
156	"	1226	76	2
157	"	1221	61	1
158	"	1221	72	2
8/13/49				
C-159	Silver	1221	63	3
160	"	1221	75	2
161	"	1221	58	2
162	"	1221	71	1
163	"	1221	67	1
164	"	1226	55	1
165	"	1226	71	3
8/13/49 cont.				
C-166	Silver	1226	62 cm.	1
167	"	1226	64	3
168	"	1226	59	1
169	"	1226	66	1
170	"	1226	60	1
171	"	1226	65	3
172	"	1226	71	1
8/18/49				
C-173	Silver	1221	68	1
174	"	1221	57	1
175	"	1221	62	1
8/19/49				
C-176	Silver	1221	67	2
177	"	1226	65	2
178	"	1226	66	3
179	"	1226	65	1
180	"	1226	53	3
181	"	1226	61	1
182	"	1226	60	1
183	"	1226	66	1
184	"	1226	58	2
185	"	1226	70	3
186	Chinook	1221	46	1
187	Silver	1221	66	2
188	"	1221	60	1
189	"	1221	54	2
190	"	1221	51	1
191	"	1221	76	2
192	"	1221	69	1
193	"	1221	65	2
194	"	1221	49	1
195	"	1221	68	2
196	"	1221	66	1
197	"	1221	52	3
198	"	1221	58	1
199	"	1221	66	1
200	"	1221	60	1
201	"	1221	76	1
202	"	1226	65	1
203	"	1226	78	1
204	"	1226	61	2

TAG NO. & DATE	SPECIES	AREA TAGGED	FORK LENGTH	CONDITION
8/22/49	DePoe Bay Tagging Cont. Astoria series, white with white blanks.			
C-205	Silver	1221	62 cm.	1
206	"	1221	59	1
207	Chinook	1221	47	1
8/23/49				
C-208	Silver	1221	60	2
209	"	1221	52	1
210	"	1221	60	2
211	"	1221	64	1
212	"	1221	54	1
213	"	1221	58	1
214	"	1221	51	1
215	"	1221	54	1
216	"	1221	69	2
217	"	1221	65	3
218	"	1221	61	1
219	"	1221	53	1
220	"	1221	70	1
221	"	1221	68	2
222	"	1221	66	1
223	"	1221	68	1
224	"	1221	58	1
225	"	1221	63	1
COOS BAY TAGGING 1949	Portland series, yellow with yellow blanks.			
7/20/49				
511-512	Chinook	1143	47	1
513-514	"	1143	58	1
7/27/49				
515-516	Chinook	1143	71	1
517-518	Silver	1143	47	3
519-520	Chinook	1143	62	1
521-522	Chinook	1143	47	3
523-524	"	1149	71	1
525-526	"	1149	58	1
527-528	Silver	1149	40	3
529-530	Chinook	1149	52	1
531-532	Silver	1149	62	1
533-534	Chinook	1143	68	1

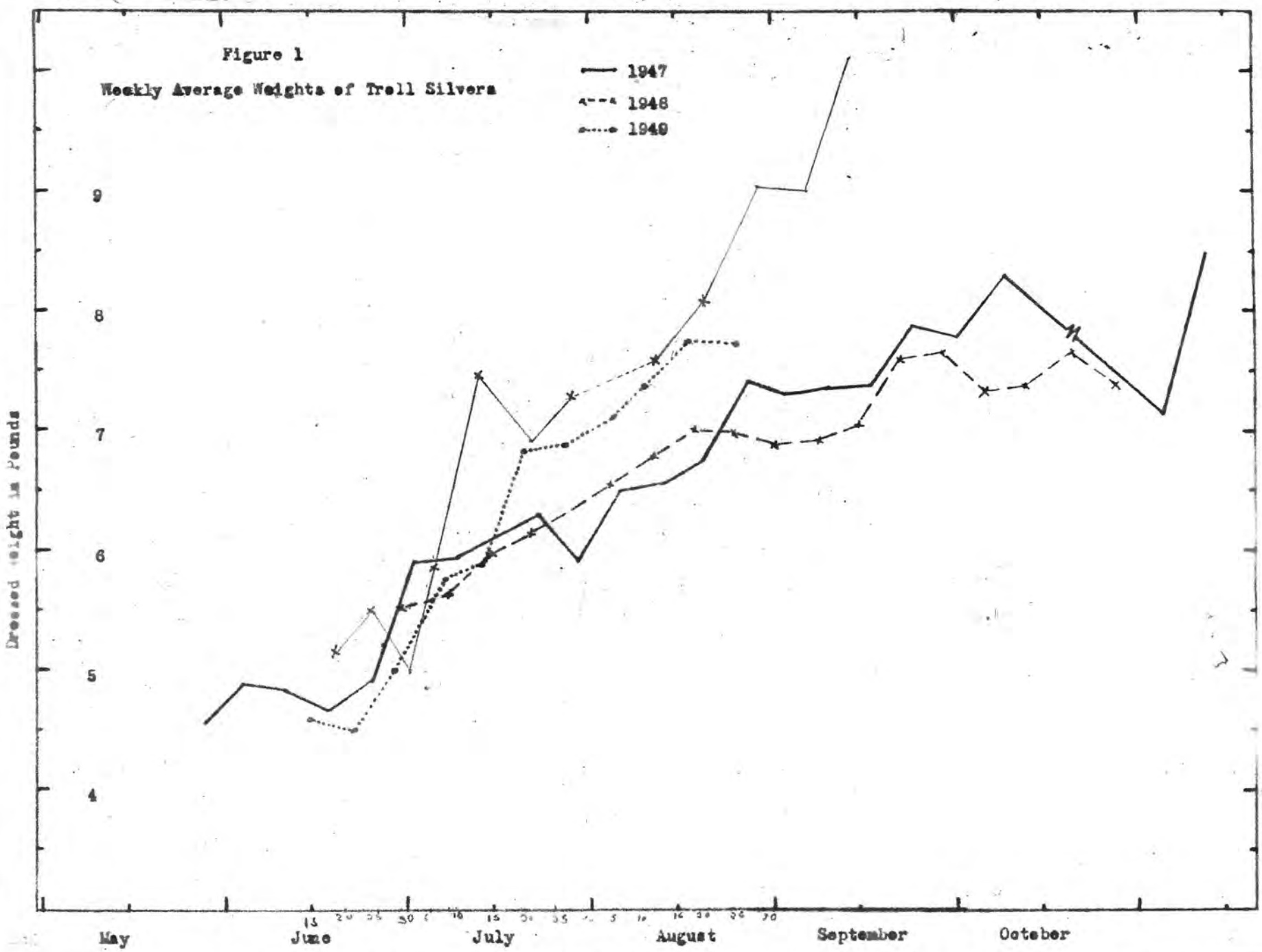
TAG NO. & DATE	SPECIES	AREA TAGGED	FORK LENGTH	CONDITION
8/16/49	Portland Series, yellow/yellow			
535	Silver	1143	39 cm.	1
536	Chinook	1143	40	1
537	"	1143	43	1
538	Silver	1143	56	1
539	Chinook	1143	44	1
540	"	1143	44	1
541	"	1143	45	2
542	"	1143	43	3
543	"	1143	43	2
544	"	1143	44	1
545	"	1143	44	1
546	"	1143	48	1
548	"	1143	43	1
549	"	1143	46	1
550	"	1143	38	1
551	Silver	1143	43	1
552	"	1143	6X	3
553	"	1143	59	1
554	"	1143	61	3
555	Chinook	1143	42	1
556	"	1143	44	1

TOTALS TO AUGUST 23, 1949

	C.	S.	Sth.	Total
Astoria	51	31	1	83
DePoe Bay	6	141		147
Coos Bay	24	9		33
TOTALS	81	181	1	263

Figure 1

Weekly Average Weights of Troll Silvers



Salmon Troll Investigation

September, October, November, and December, 1949

General.

A poor trolling season became progressively poorer as the season advanced. A few fish were landed during September, but by October they were becoming very scarce, and by the end of the season, practically no boats were fishing. Some tagging was done during September and October and considerable time was devoted to sampling the catch, although the small landings made this difficult. November and December have been spent working up the summer's sampling data, which are summarized here. About a week was spent surveying some of the tributaries of the Nehalem River, and several days of assistance was given to the shellfish investigation.

A meeting of the salmon committee of the Pacific Marine Fisheries Commission on November 21 and 22 in Seattle was attended and also a Tri-state meeting on December 12 in Portland.

Chinook Salmon Sampling.

For the first time a good sample of the spring troll catch was obtained. Numbers of chinooks were found off the Columbia during April, May, and June which were sampled. Very few landings were made along the coast during that time, so the Astoria samples may be considered fairly representative of the state. During July, August, and September fish began to appear along the coast and samples were then taken of them. The August run of salmon off the Columbia was a disappointment and relatively few large salmon were landed.

Average Weights of Chinook Salmon

Table 1 gives the average weights taken in 1949 and Figure 1 shows a comparison of 1947, 1948, and 1949. The line for 1947 is much higher early in the season than is the line for 1948 and 1949, which probably

reflects a change in the age composition of the fish. Since the large maturing fall chinooks are available during the early season, large numbers of them and smaller numbers of small chinooks would bring the average weight up, and conversely if the maturing chinooks were scarce and the small ones abundant it would bring the average weight down. The low average weight this year is at least partly due to a poor run of salmon into the rivers, which might be correlated with the higher average weight and larger run of 1947. Each year since sampling began, the chinooks have been averaging smaller; in 1947 they averaged 13.0 pounds, 12.1 pounds in 1948, and 11.3 pounds in 1949.

Figure 2 shows the average weight by area. The Astoria area has a very low average weight until the large mature chinooks appear in August, while the Newport area has a high average weight early in the season but drops off in August. Coos Bay has a trend similar to Newport, but at a much lower level. This has been interpreted as showing that large maturing fish are available off the coast (especially Newport) during the early season and move up to the Columbia during August, leaving smaller immature fish along the coast. A great deal more tagging of chinook salmon along the coast is needed to show to what extent they do migrate North to the Columbia River.

Length-frequencies of Chinook Salmon

An examination of the length-frequencies for 1947, 1948, and 1949 indicates a considerable change in the length (and therefore age) composition of the catch. Figure 3 shows a comparison of the three years. In 1948 there was a large mode of fish just above the legal size of 27 inches total length (64 cm. fork length). In 1949 this mode had apparently moved up to around 72 centimeters. The reduction of the size limit to 26 inches

apparently had little effect upon the size of the fish landed this year, since there were few small fish present. The 1947 data suggest three age groups, whose modes correspond roughly to the other two years. The small graph in the corner of Figure 3 shows the percent of fish at each centimeter of length, and illustrates a little more clearly the change in the length composition of the catch between 1948 and 1949.

Figure 4 shows the length-frequencies on a monthly basis for 1949. During most of the months, three modes can be discerned at roughly 70, 80, and 90 centimeters. During September another mode appears at 62 centimeters, possibly another age group entering the fishery, and the 90 centimeter group largely disappears.

Mark Recovery of Chinook Salmon

Sampling of fish for clipped fins continued as before. There were 7,173 chinooks examined and Table 2 summarizes the markings and recoveries. Since the 2/ and 3/ age groups (brood years of 1945 and 1946) comprise about 85 percent of the troll catch, the numbers of fish marked during those two years is included. About 328,000 marks were theoretically available, 302,000 of the 1945 brood year and 26,000 of the 1946 brood year. It is seen that all three recoveries were from the Lewis River releases of 10,000 fish. Why none of the 1945 brood year were not recovered is a mystery since they involved so many more fish.

Little can be ascertained about migrations from these meager data. It appears that larger samples must be obtained if anything is to be learned about migrations from a marking program.

In addition the following single fin clips were observed in the sample:

LP. - 2
LV. - 3
RV. - 1
Ad. - 3

Silver Salmon Sampling.

This fishery has been practically a failure this year. The fish were very scarce during June and early July, but around the middle of July a large run of large fish appeared off Newport. They reached a peak around the first of August and then rapidly dropped off in numbers, and fishing again became poor. There seemed to be some indication this season of an inshore movement, and the possible presence of inshore and offshore groups of silvers. Although the data do not indicate the change too clearly, it was evident from observation of the fishery through the season that something was radically different from last year. This will be discussed later.

Average Weights of Silver Salmon

Figure 5 shows a graph of the average weights for the past three years by week. It is at once evident that the average weights this year have a different trend. The fish were smaller at first, but the line rises sharply and levels off at a slightly higher weight than the other two years. It was very noticeable during the field work that the silvers were much larger this year than last, although in fewer numbers, and the graph clearly shows this to be the case. A faster rate of growth is the logical reasoning, but it could also be caused by the movement inshore into the fishery of larger fish from some offshore feeding ground. The water may have been warmer offshore and the food more abundant, which would cause a faster growth and may account for the larger size this year. Several factors combine to give one the impression that most of the silvers were offshore during the spring and early summer: silvers were almost entirely absent from the coastal waters during April and May and only during June did they appear, they suddenly appeared the latter part of July in large numbers, the fish which appeared in July were noticeably

larger than those which had been landed during June, silvers are primarily surface feeders and are not found in very deep water as chinooks sometimes are; tuna fisherman have reported seeing silvers occasionally hundreds of miles offshore.

Figure 6 is a comparison of the average weights taken at the three ports. Some similarity is noted between this graph and the graph of the average weights of chinooks by port, in that the fish along the coast were larger than the fish at the mouth of the Columbia early in the season, but the Columbia fish surpassed them during August. It has been proven by tagging that silvers migrate North along the coast to their home streams, and this lends credence to the hypothesis about chinook salmon migration. These data also suggest that Columbia River silver salmon may be slightly larger than those of the coastal streams.

Length-frequencies of Silver Salmon

Figure 7 shows the length-frequencies taken during the season. They indicate a rapid increase in size between June and July and a slower increase the remainder of the season.

Mark Recovery of Silver Salmon

Table 4 summarizes the markings and recoveries. There were 11,385 silvers examined and one mark was found. In addition the following single clips were noted in the sample:

RV. - 6
BV. - 4
RP. - 2
Ad. - 10
LP. - 1
LV. - 2

Tagging.

The poor fishing this year was reflected in the tagging, a great amount of effort and money was expended, but the results were very poor.

Approximately the same number of salmon were tagged this year as last year, but it required four times as much money and their have been only half as many recoveries.

Table 5 summarizes the season's tagging.

The silvers again showed a northerly migration, although not as clear cut as last year. The silvers that were recovered to the south were taken by trollers, and may have been on a feeding migration and they would also possibly return to the North to spawn.

Not enough chinooks have been recovered to show any migration pattern. The chinook that migrated to a tributary of the San Joaquin River indicates that there are some Sacramento-San Joaquin chinooks taken off the Oregon coast.

Two chinooks and two silvers tagged in 1948 were recovered in 1949. The recovery of the silvers is interesting inasmuch as they were in their third year when tagged and their recovery in 1949 would make them four years of age. Perhaps more silvers mature at four years than is generally thought.

Observations were again made as to the condition of the fish when tagged and their subsequent recovery. Although the results are not significant, it was again found that several fish which were badly injured and floated away in poor condition were later recovered.

The recovery this year was 3.8 percent for silvers and 1.8 percent for chinooks, for a total of 3.2 percent.

In line with the request for consolidation of all tagging information, Table 6 is presented. This is a summary of all the tags put out by the troll salmon investigation.

Jack M. Van Hyning.
Aquatic Biologist

Table 1.

Average Weights of Troll Chinook Salmon in 1949

	April		May		June		July		August		September		October		Total	
	Number Weighed	Total Weight	No.	Wgt.	No.	Wgt.	No.	Wgt.	No.	Wgt.	No.	Wgt.	No.	Wgt.	No.	Wgt.
Astoria	325	3,094	193	1,747	407	3,539	377	4,058	509	7,366	172	1,955	15	172	1,998	21,928
	Av.	9.52	Av.	9.04	Av.	8.70	Av.	10.76	Av.	14.47	Av.	11.37	Av.	11.47	Av.	10.98
Newport					551	6,828	230	3,088	68	896	9	81			858	10,893
					Av.	12.39	Av.	13.43	Av.	13.18	Av.	9.00			Av.	12.70
Coos Bay					178	1,736	421	4,797	691	7,728	401	4,193			1,691	18,454
					Av.	9.75	Av.	11.39	Av.	11.18	Av.	10.46			Av.	10.91
Total	325	3,094	193	1,747	1,136	12,103	1,028	11,943	1,268	15,990	582	6,229	15	172	4,547	51,275
	Av.	9.52	Av.	9.04	Av.	10.65	Av.	11.63	Av.	12.63	Av.	10.70	Av.	11.47	Av.	11.28

Table 2.

Mark Recovery of Troll Chinook Salmon in 1949

Brood Year of 1945

Mark	Place Marked	Number Marked	No. Recovered	Place Recovered	Date	Age	Fork Length
Ad. RV.	Willapa	7,000	0				
Ad. LV.	Dungeness (P.S.)	4,000	0				
Ad. BV.	Wind R. (Col.)	21,000	0				
D. RV.	Sacramento	50,000	0				
	Greys Harbor	4,000	0				
D.LV.	Sacramento	41,000	0				
	Willapa	6,000	0				
D. Ad.	Issaquah (P.S.)	8,000	0				
An. RV.	Sacramento	49,000	0				
	Lewis R.	10,000	0				
An. LV.	Sacramento	42,000	0				
	Columbia	10,000	0				
D.R.P.	White Salmon (Col.)	25,000	0				
D.L.P.	"	25,000	0				

Brood Year of 1946

Ad. RV.	Lewis River (Col.)	5,000	1	Mouth of Columbia	26 Aug.	2+	60 cm.
Ad. LV.	"	5,000	2	"	5 July	2+	61 cm.
				"	15 July	2+	59 cm.
Ad. BV.	Green R. (P.S.)	16,000	0				
		328,000	3				

Table 3.

Average Weights of Troll Silvers - 1949

	June		July		August		September		October		Total	
	Number Weighed	Total Weight	No.	Wgt.	No.	Wgt.	No.	Wgt.	No.	Wgt.	No.	Wgt.
Astoria	839	3,683	457	2,839	789	5,940	416	3,361	45	367	2,546	16,190
	Av.	4.39	Av.	6.21	Av.	7.53	Av.	8.08	Av.	8.16	Av.	6.36
Newport	40	262	108	800	101	744					249	1,806
	Av.	6.55	Av.	7.41	Av.	7.37					Av.	7.25
Coos Bay	198	1,042	894	6,022	1,319	9,941	564	4,395	33	293	3,008	21,693
	Av.	5.26	Av.	6.74	Av.	7.54	Av.	7.79	Av.	8.88	Av.	7.23
Total	1,087	4,987	1,459	9,661	2,209	16,625	980	7,756	78	660	5,803	39,689
	Av.	4.63	Av.	6.62	Av.	7.53	Av.	7.91	Av.	8.46	Av.	6.84

Table 4.

Mark Recovery of Troll Silver Salmon

Brood Year of 1946

Mark	Place Marked	No. Marked	No. Recovered	Place Recovered	Date	Age	Fork Length
Ad. LV.	Sand Creek Weir	1,177	1	Mouth of Columbia	4 Aug.	2+	64 cm.
D. RV.	Minter Creek (PS.)	6,716	0				
D. LV.	"	6,716	0				
Total		14,609	1				

Table 5.

Troll Salmon Tagging
1949

Tagged

	Chinooks	Silvers	Steelhead	Total
Astoria	54	32	1	87
Depoe Bay	8	193		201
Coos Bay	50	32		82
Total	112	257	1	370

Recovered

Tagged				Recovered				
Tag No.	Date '49	Location	Condition	Date '49	Location	Days Out	Migration	Growth
			Silvers					
C-703	24 June	Mouth of Columbia	2	6 Sept.	Frazer River, B.C.	74	280 mi. N.	
738	13 July	" " "	1	17 Aug.	Whidbey Island	26	240 " N.	
762	22 "	" " "	3	1 Sept.	Off the Mouth of Columbia	50	0	5 cm.
98	4 Aug.	Depoe Bay	1	22 Sept.	Sooke, B.C.	49	270 " N.	
106	4 Aug.	" "	1	1 Oct.	Kalama R. Wn.	57	160 " N.	
124	5 Aug.	" "	1	28 Aug.	Off Umpqua R.	23	70 " S.	
136	6 Aug.	" "	1	19 Aug.	Off Newport	13	20 " S.	
199	19 Aug.	" "	1	10 Sept.	Lower Columbia R.	22	90 " N.	
246	28 Aug.	" "	1	22 Sept.	Tillamook R.	26	55 " N.	
250	27 Aug.	" "	2	18 Oct.	Naselle R. Wn.	52	130 " N.	
			Chinooks					
742	13 July	Tillamook Head	3	1 Dec.	Tuolumne R., Calif.	141	650 " S.	2 cm.
769	22 "	Mouth of Columbia	1	17 Sept.	Lewis R. Wn.	57	80 " E.	

Table 6.

Tags Put Out by the Troll Salmon Investigation

Series	Tag Numbers	Date	Area
Portland A	400 to 599	June 1948	Mouth of Columbia to Cape Lookout
"	630	June 1948	" " " " " "
"	638	" "	" " " " " "
Astoria C	1 to 50	June to August, 1948	Off Newport
Reedsport	12 to 31	June 1948	Off Coos Bay
"	100 to 109	" "	" " "
Astoria B	601 to 696	June to August, 1948	" " "
Astoria C	702 to 794	June to September, 1949	Mouth of Columbia to Cape Lookout.
"	74 to 279	July to September, 1949	Off Depoe Bay
Portland F	511 to 605	July to October, 1949	Off Coos Bay

Mostly silver and chinook salmon, a few steelhead, rock fish, ling cod and sable fish.

Figure 1

Average Weights of Troll Chinook Salmon

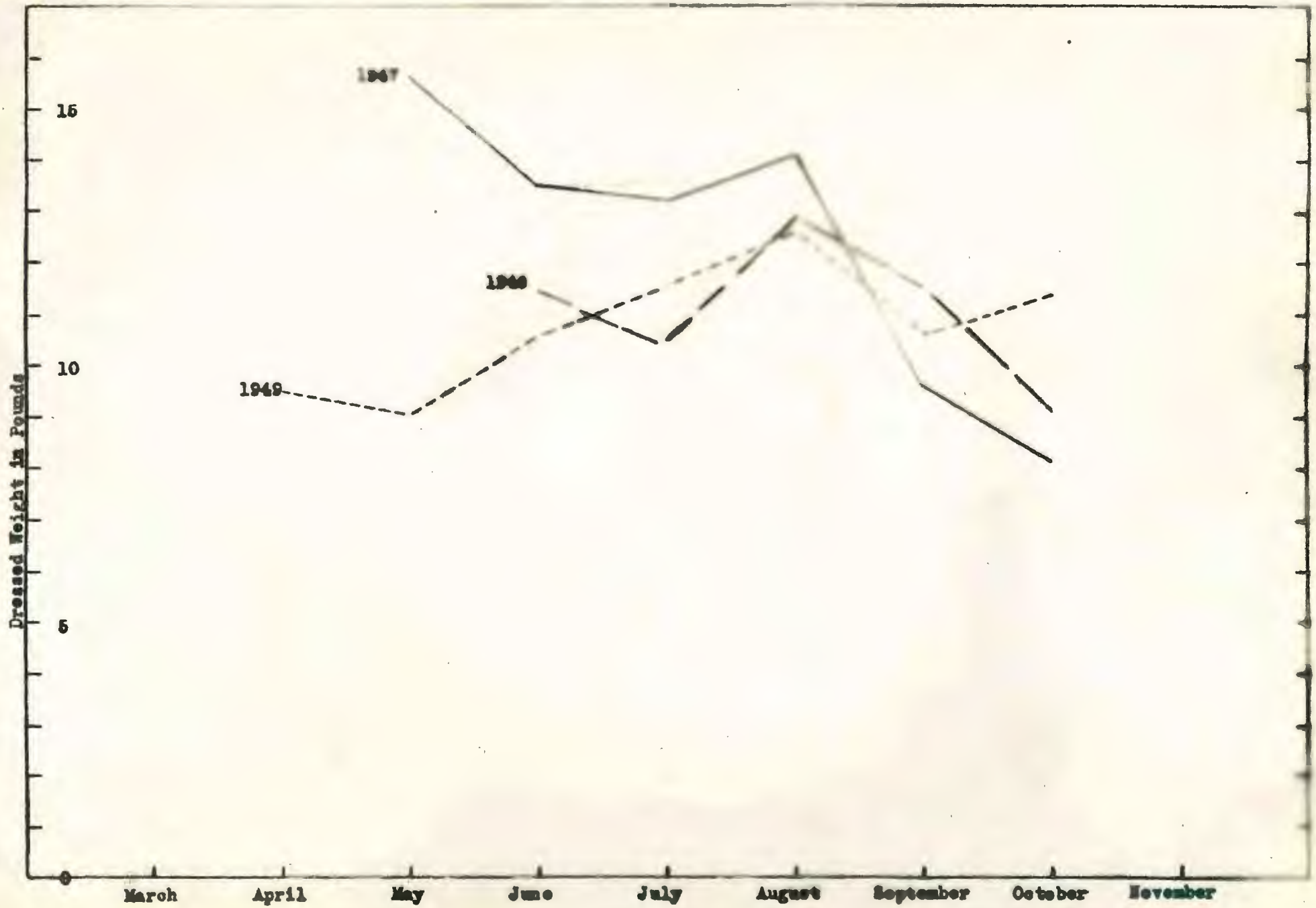


Figure 8.

Average Weights by Area of Trawl Chinook in 1969

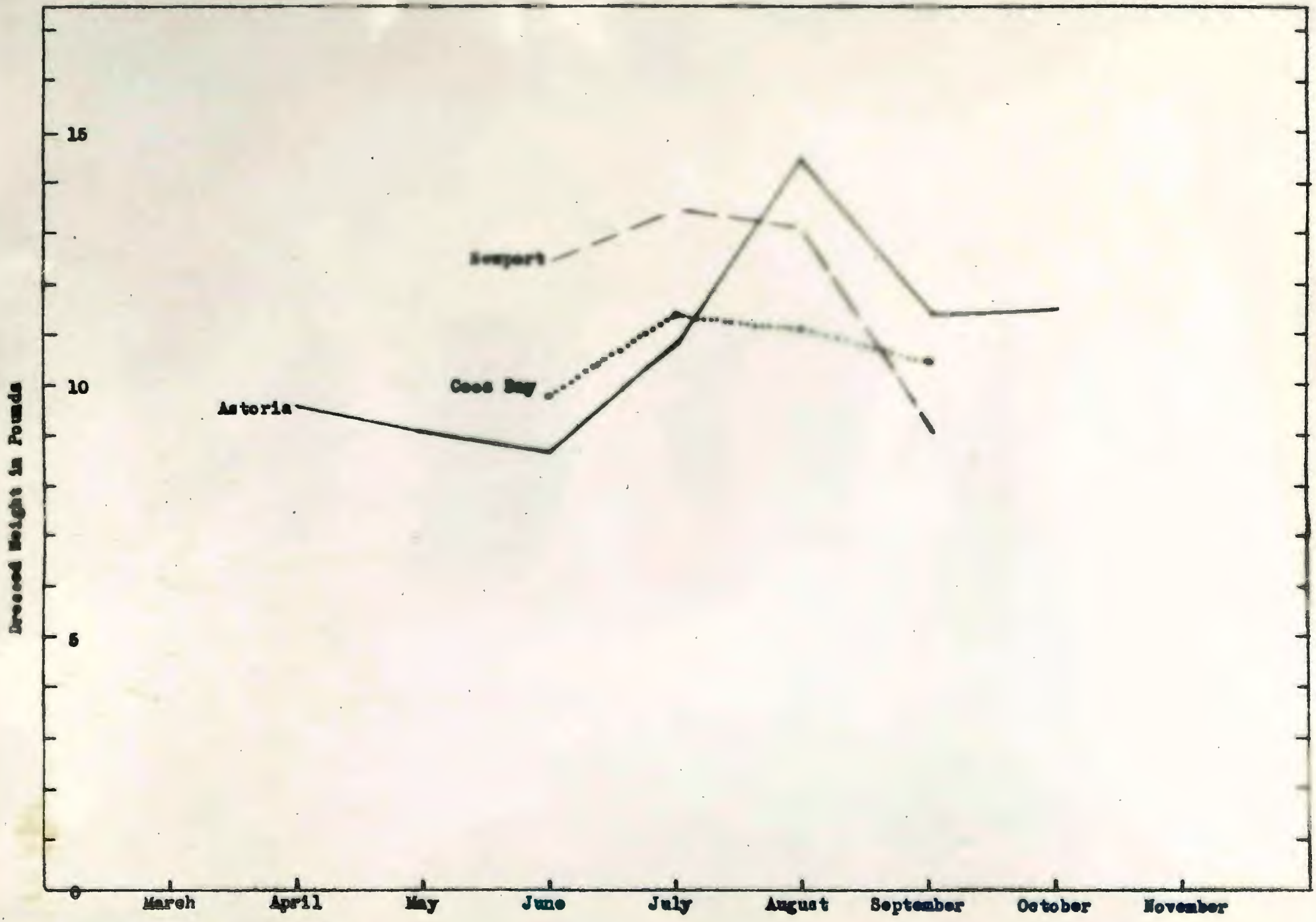
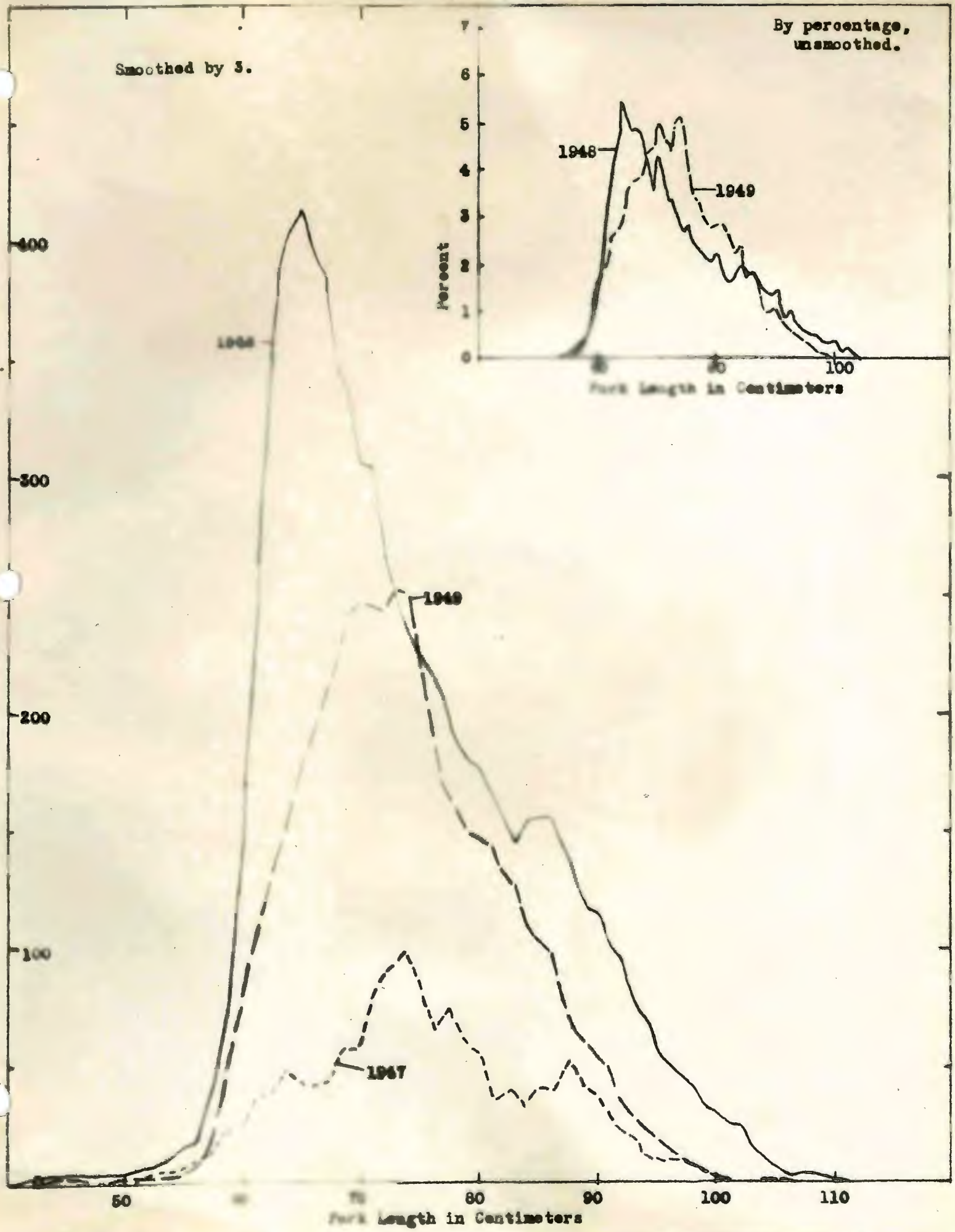


Figure 3.

Length - frequency of Troll Chinook Salmon



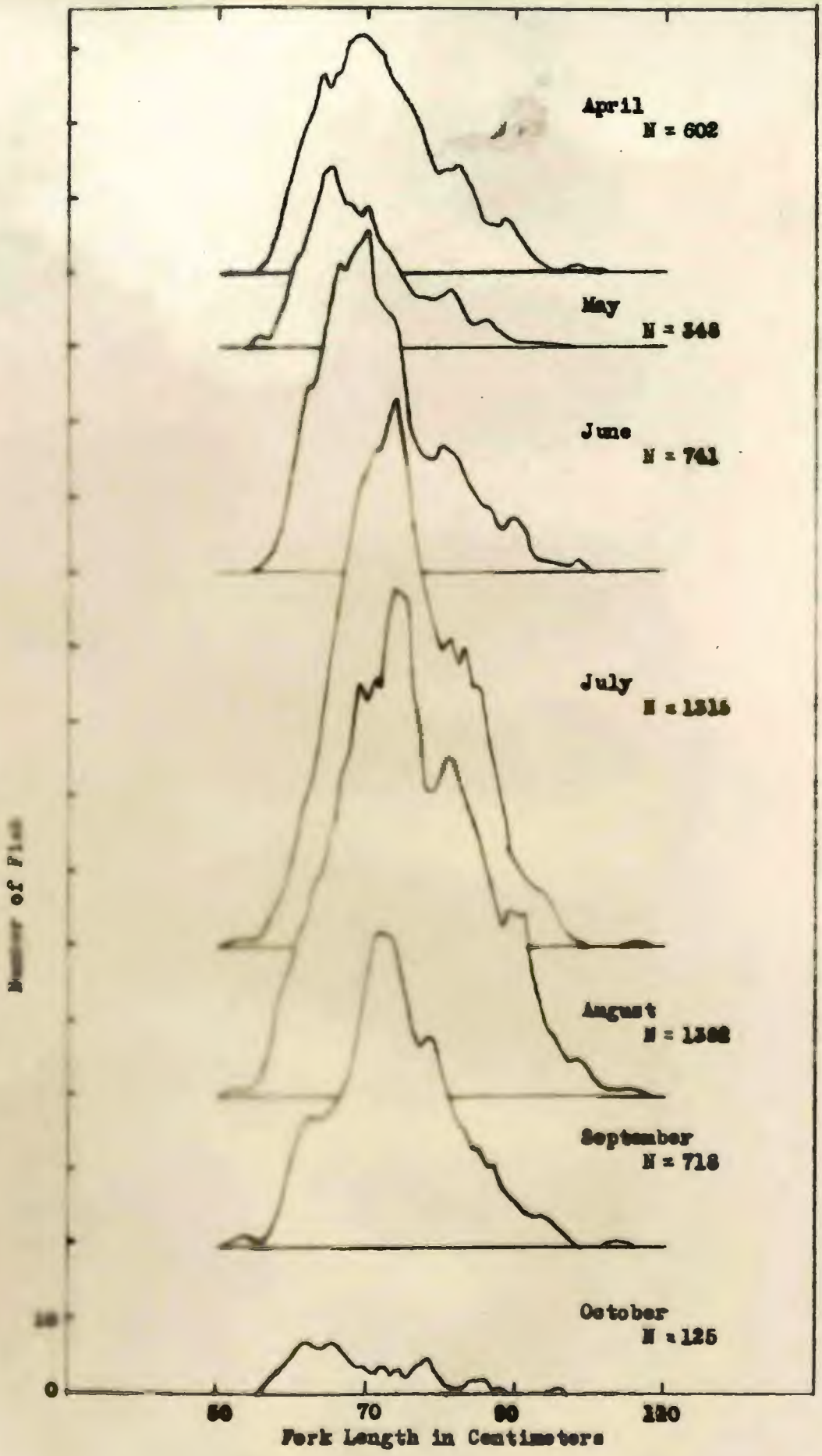


Figure 4.
Length - frequency of Troll Chinook Salmon by month in 1949.

Figure 5.

Average Weights of Troll Silver Salmon by Weeks in 1947, 1948 & 1949

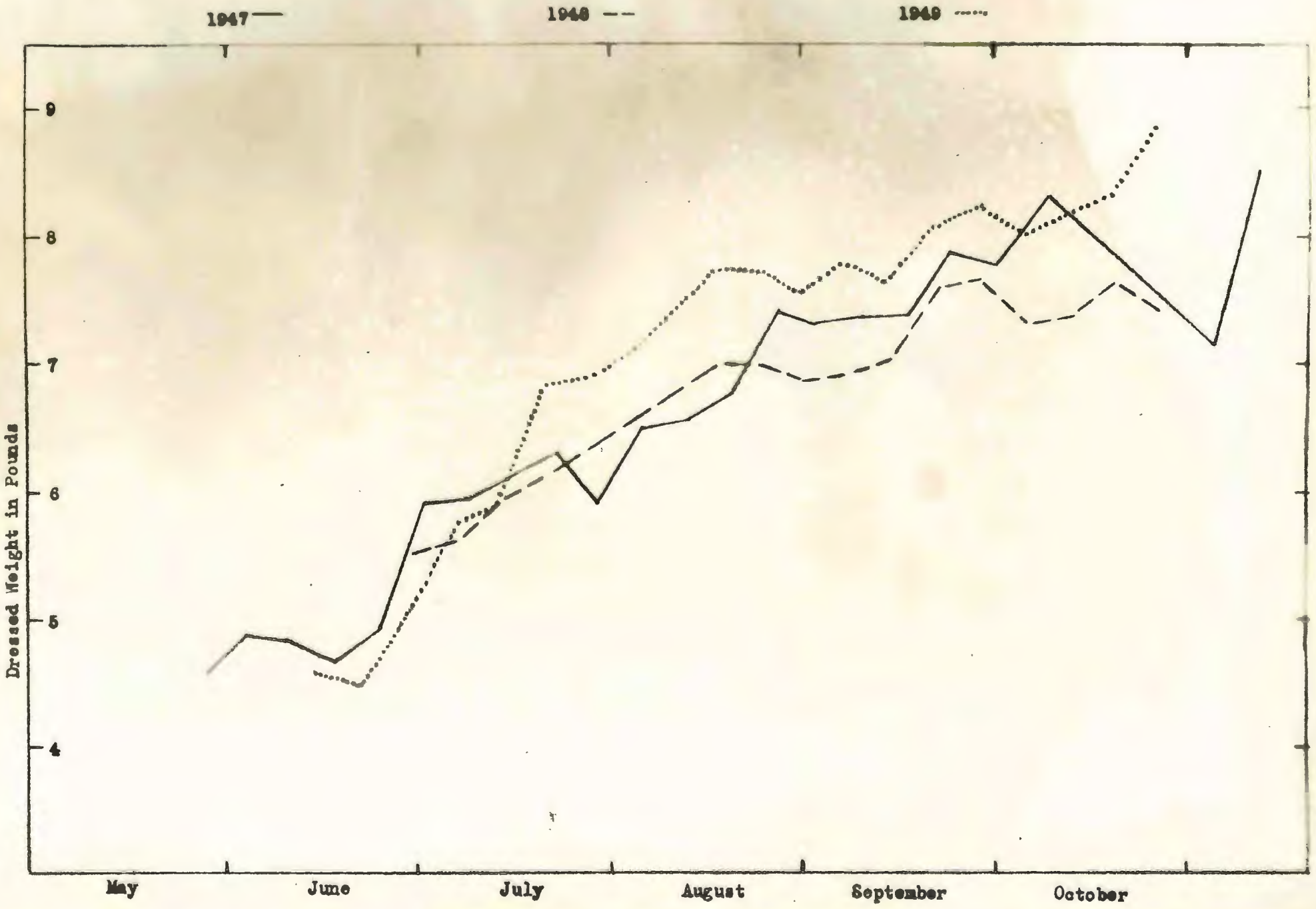


Figure 8

Average Weights of Troll Silver Salmon by Area in 1948

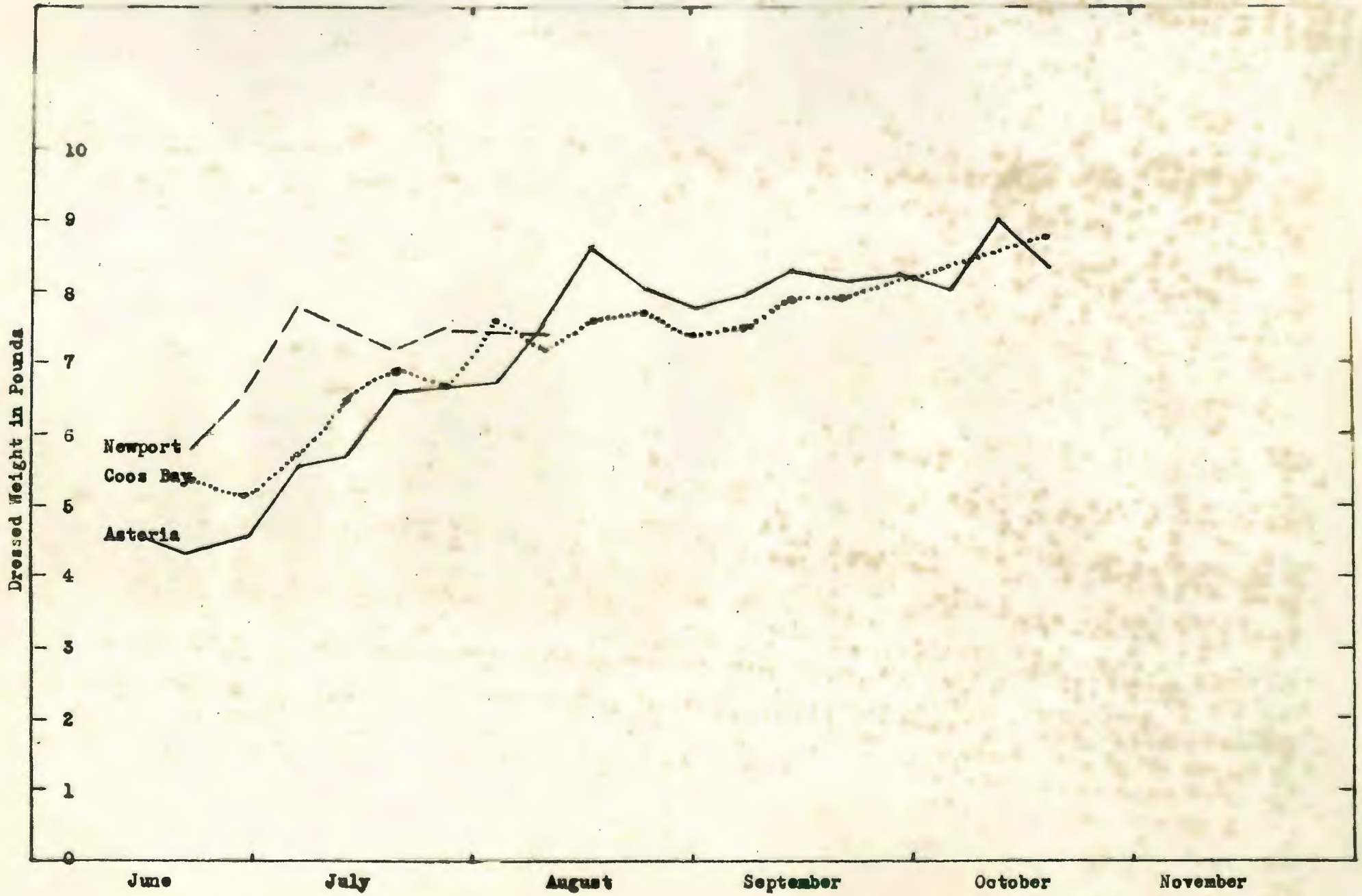
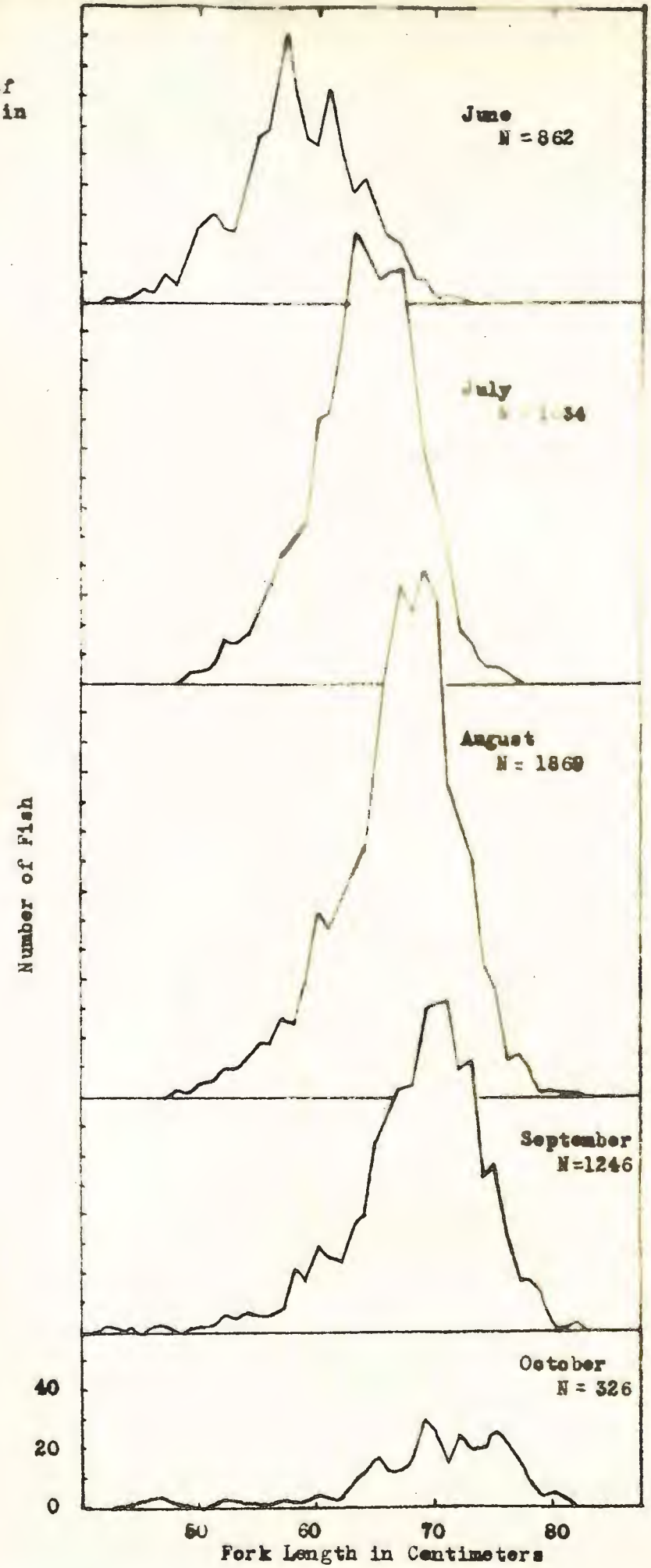


Figure 7.

Length - frequency of Troll Silver Salmon in 1940



SALMON TROLL INVESTIGATION

PROGRESS REPORT, JANUARY THROUGH JUNE, 1950

During January, February, and March most of the time was devoted to mounting and reading scales of the 1946 and 1947 troll chinook catch, and going over the 1947 data in an attempt to get it in a recognizable and presentable form. Also some time was spent gathering together miscellaneous odds and ends of data for the Pacific Marine Fisheries Commission and the statistical bulletin. Equations were calculated for converting fork to total lengths of chinook and silver salmon, and several length-weight equations were re-calculated.

The staff meeting of the Research Division at Clackamas was attended from January 18 through 21.

The meeting of the Pacific Fisheries Biologists was attended at Lake Quinnalt on March 23, 24, and 25.

The troll chinook season opened on March 15, and the sampling program was again instigated. The procedure was much the same as last year, with emphasis placed on scale samples and length-frequencies of chinook salmon.

The weather was stormy until around April 1, at which time fair numbers of chinooks were found off the Columbia River. This was the only place on the coast that had any fish, and a very large fleet gathered. Although the weather was bad, and the fish not too abundant, the extremely high price resulted in a good catch during April.

During May, with the spring chinook run having entered the river, the size of the catch and the size of the fish dropped accordingly. As can be seen from Table 1 and Figure 1, the fish were very small during May. As usual during May and June, the fleet began to scatter north and south, but results from these trips were not very encouraging. During June some chinooks appeared off Gray's Harbor which entered the Astoria catch, but the fish off

the Columbia were, for the most part, rather small and scarce.

On May 15, Mr. Ray Reerink was transferred from the Columbia River Investigation to Astoria. He assisted with the sampling and mounted a great many chinook scales.

On May 22 and 23 a trip was made down the coast as far as Coos Bay to distribute log books and perhaps tag some silvers, schools of which were reported off Coos Bay. The weather prevented attaining the latter objective. About 30 log books have been distributed to interested trollers along the coast and some valuable data are anticipated.

Mr. Reerink was transferred to Coos Bay on June 8 to sample and tag there. Mr. Harry Moore reported to work on June 9 at Newport and Mr. Robert Heg at Astoria on June 15. Mr. Eldon Korpela was engaged by the Pacific Marine Fisheries Commission to tag on a part-time basis.

Several trips were made down the coast during June to get the summer's field work underway: to Newport and Coos Bay on June 8, 9, and 10, to Newport on June 22 and 23 and on June 28, 29, and 30. Some time during June was also spent on the budget for the 1951-53 biennium.

Practically no chinooks were landed along the Oregon coast before the sampling began in June, and thanks are due to Mr. Ray Morgan for obtaining a sample of what few fish were landed at Coos Bay during the spring.

During June, chinooks began to appear along the coast and good samples were obtained of them. Mostly large fish were taken off Newport and large and small mixed off Coos Bay.

The silver season opened on June 15. Silvers, while not abundant, were found in larger numbers than at the same time in 1949. Table 2 and Figure 2 give the sampling data for silver salmon. Additional data on the relationship between round and dressed weights, sex ratios and stomach contents are being obtained from the ocean sport fishery at Newport as well

as on the tagging trips.

Some preliminary tagging was done during June, but not enough to warrant including in this report. An intensive tagging program is being conducted during July and will be carried on through August and September.

All spare moments during the period were devoted to preparing a detailed report on the progress and results of the investigation of the troll salmon fishery for the Pacific Marine Fisheries Commission, as well as attempting to gather together the catch statistics of the fishery for the forthcoming statistical bulletin.

Jack M. Van Hyning
Aquatic Biologist

8/2/50

Table 1. Troll Chinook Salmon Sampling
1950

	Average Weight No. of Fish	Wt. of Fish	Average Weight	Mark Ratio No. of Fish	Marks	No. of Scale Samples and Length-Weight Samples Taken
April						
Astoria	1,312	13,154 lbs.	10.03 lbs.	2,098	1 - BV 2 - Ad.	308
Coos Bay	7	88	12.57	7	0	7
Total	1,319	13,242	10.04	2,105	3	315
May						
Astoria	433	3,747	8.65	818	0	216
Coos Bay	10	112	11.20	10	0	10
Total	443	3,859	8.71	828	0	226
June						
Astoria	910	9,654	10.61	1,018	1 - RV	269
Newport	1,429	20,447	14.31	2,020	0	374
Coos Bay	605	6,540	10.81	579	0	317
Total	2,944	36,641	12.45	3,617	1	960
TOTAL	4,706	53,742	11.42	6,550	4	1,501

Table 2 Troll Silver Salmon Sampling
1950

	Average Weight No. of Fish	Wt. of Fish	Average Weight	Mark Ratio No. of Fish	Marks	No. of Scale Samples and Length-Weight Samples Taken
June						
Astoria	194	952 lbs.	4.91 lbs.	528	0	34
Newport	490	2,621	5.35	490	1 - BV	79
Coos Bay	158	926	5.86	160	0	84
Total	842	4,499	5.34	1,178	1	197

Figure 1.

Random Length-frequencies of the Troll Chinook Catch for April, May and June, 1950.

Smoothed by 3.

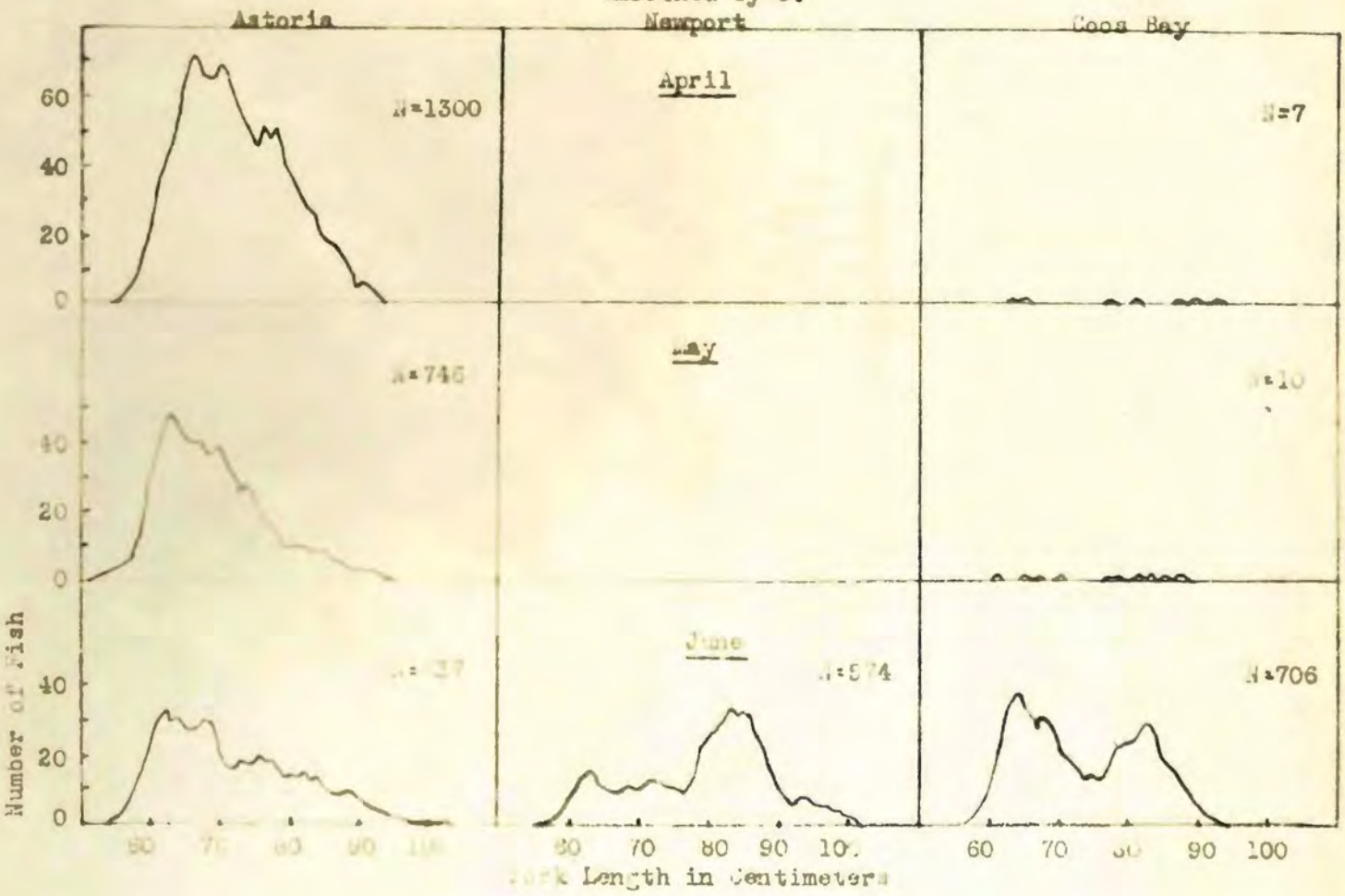
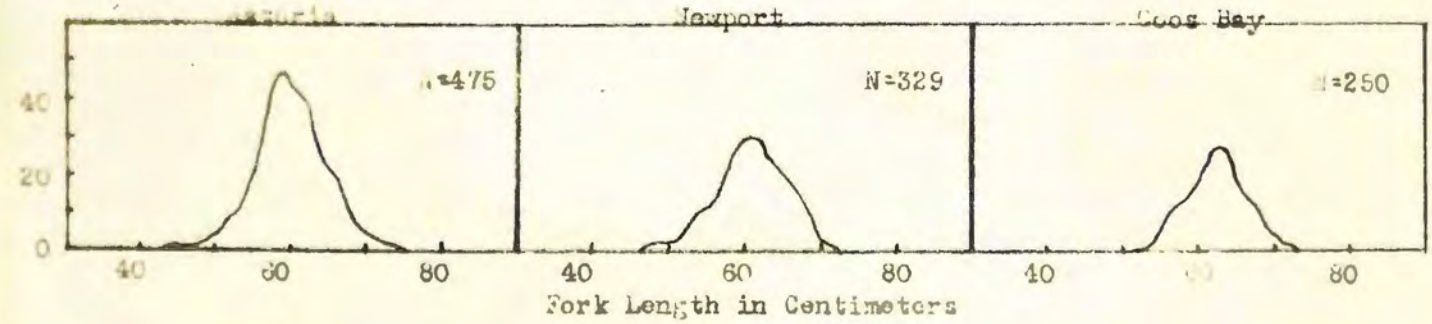


Figure 2.

Random Length-frequencies of two Troll Silver Salmon Catch for June, 1950.
Smoothed by 3.



PROGRESS REPORT
TROLL SALMON INVESTIGATION

July and August, 1950

General

Much of this period was spent in tagging. Good samples of the commercial catch also were obtained. A great deal of time was spent finishing a report for the Pacific Marine Fisheries Commission. The report for the Statistical Bulletin also was completed. The staff meeting was attended, also one day of the American Fisheries Society meeting in Portland.

The troll fishery during this period has been rather spotty. During the greater part of July most of the boats were engaged in the more profitable albacore fishery. In early August fair numbers of chinook salmon were taken off the Columbia River, and later in the month there was what appeared to be a very good catch of silvers for a short period.

Tagging

Considerable effort was expended this season in troll tagging. Table 1 summarizes the tagging in the three areas from June 9 to September 1, 1950. Even though emphasis was placed on chinooks many more silvers were tagged, due to their greater abundance in the catch. Table 2 gives a complete list of all tags put out from June 9 to September 1.

There were two recoveries made during the period, one silver, tagged off Coos Bay on July 8 was recovered August 21, in the same area, and a chinook, tagged August 5 off Bandon, was taken in the Klamath River, August 24.

Chinook Salmon Sampling

During July, few chinook salmon were landed, since almost all of the larger trollers were fishing albacore and the small day boats found it more profitable to concentrate on silvers. During early August, mature chinooks

began to gather off the mouth of the Columbia River, resulting in fairly good fishing for a short time. Later in the month, most of these fish had entered the river, and the troll chinooks ran rather small and appeared to be mainly immature fish. This is reflected in the average weight of 11.4 pounds for the Astoria area during August, as compared with 14.5 pounds for August, 1949. It is also worth noting that the chinook length frequency distribution for August in the Astoria area is almost identical to that for July in the Coos Bay area, and vice-versa. This seems to suggest a northward movement of mature fish.

During July and August, 5,291 chinooks were examined for marks. One marked fish was recovered. This was an anal-right ventral fin clip, caught off the Columbia River on August 7. Scale readings indicated that it was one of a group released in the Willamette River in October, 1948. In addition, one fish was found with both ventral fins missing. No other marks or single fin clips were seen.

Table 3 is a summary of the data taken on average weight, catch per boat per day, and mark ratio, and of the number of scale samples, length-weight samples and length frequencies taken. Figure 2 shows the length frequency distribution for chinook salmon during the months of July and August for the three areas.

Silver Salmon Sampling

The silver salmon sampled this year have averaged somewhat larger than those taken in 1949, and considerably larger than the 1947 and 1948 fish. This, however, may not be unusual, since the fishermen state that the 1947 and 1948 fish were unusually small. As in 1949, the season has been characterized by sudden movements of larger fish into the fishery. Between the second and third weeks of July, the average weight of fish landed at Coos Bay increased from 5.8 to 8.2 pounds. A similar increase in the size of the fish occurred at Newport and about a week later at Astoria.

During the second and third weeks of August there was another sudden increase in average weight at all ports, together with vastly improved fishing, especially at Astoria and Newport. As in 1949, the Coos Bay fish averaged larger in the early part of the season, and the Astoria fish later on. This is possibly due to the northward movement of Columbia River fish, which may be larger than those of the coastal streams. The extremely low average weight for the week of July 26 to August 2 at Newport may not present a true picture, since the week's data were taken from three small day boats, one of which encountered extremely small fish, averaging only 4.4 pounds. In general, fishing was poor in July, and all boats that were large enough fished albacore. After the second week of August fishing suddenly improved, and remained quite good into the first week of September.

Up to September first, 9,024 silvers were examined for fin clips. Eight fish were found with one fin or both ventral fins missing. Since no marked three-year silvers are out this year, these observations should give some good information on the natural occurrence of marks.

Table 4 gives a brief summary of the data taken on average weight, catch per boat per day, and mark ratio, together with the number of length-weight and length frequency samples taken. Table 5 summarizes the average weight data by weeks for the three areas, and these data are presented as a graph in Figure 1. Figure 3 shows the length frequency distribution for silver salmon during the months of July and August for the three areas.

Resume of Tags Put Out by the Troll Salmon Investigation
to September 1, 1950

Oregon Fish Commission

Series	Color of Tag	Tag No.'s	Color of Blank	Date	Area
Portland A	White	400 - 599	Blue	June, 1948	Off Columbia River
"	"	630	"	" "	"
"	"	638	"	" "	"
"	"	631-699	Yellow	June - Aug. 1950	Off Coos Bay
Astoria C	White	1 - 50	White	June - Aug. 1948	Off Newport
"	"	74-279	White	June - Aug. 1949	Off Depoe Bay
"	"	280 - 300	Yellow	June - Aug. 1950	Off Coos Bay
"	"	702 - 794	Blue	June - Sept. 1949	Off Columbia River
"	"	801 - 951	Oregon	June - July 1950	Off Columbia River
Astoria B	White	601 - 696	Yellow	June - Aug. 1948	Off Coos Bay
Reedsport	Green	12 - 31	White	June, 1948	Off Coos Bay
"	"	100 - 109	White	" "	" " "
"	"	1549 - 1556	Yellow	Aug., 1950	" " "
Portland F	Yellow	511 - 605	Yellow	July - Oct. 1949	" " "
"	"	606 - 699	Yellow	June - Aug. 1950	" " "
Astoria R	White	1 - 206	White	June - Aug. 1950	Off Newport
"	"	400 - 499	Yellow	" "	Off Coos Bay
Strap Tag Z	Metal	11 - 22	None	July - Aug. 1950	Off Columbia River
" "	Metal	27 - 39	"	" "	Off Newport

All tags are solid colors.
These tags were put out mostly on silver and chinook salmon; a few steelhead, rock fish, ling cod and sable fish were also tagged.

Table 3. Summary of Chinook Salmon Sampling Data, 1950

Area	Month	AVERAGE WEIGHT No. Fish	Total Weight	Avg. Weight	MARK RATIO No. Examined	Marks Found	No. L-F Taken	No. Scale Samples & L-W Taken	Catch/Day Fish	Pounds
Columbia R.	April	1,312	13,154	10.0	2,098	2 Ad. 1 BV	1,300	308		
Newport		--								
Coos Bay		7	88	12.6	7	0	7	7		
Total				(Single Clips)	2,105	3	1,307	315		
				(Marks)	2,105	0				
Columbia R.	May	433	3,747	8.6	818	0	746	216		
Newport		--								
Coos Bay		10	112	11.2	10	0	10	10		
Total					828	0	756	226		
Columbia R.	June	910	9,654	10.6	1,018	1 RV	637	269	6	63
Newport		1,429	20,447	14.3	2,020	0	574	379	13	192
Coos Bay		605	6,540	10.8	579	0	706	284	16	169
Total				(Single Clips)	3,617	1				
				(Marks)	3,617	0	1,917	932		
Columbia R.	July	154	1,385	9.0	375	0	288	217	3	32
Newport		70	956	13.7	1,604	0	185	38	3	36
Coos Bay		277	3,171	11.4	277	0	536	282	7	76
Total					1,656	0	1,009	537		
Columbia R.	August	269	3,077	11.4	3,151	1 AnRV 1 BV	690	295	4	47
Newport		164	1,873	11.4	381	0	167	39	4	40
Coos Bay		103	1,049	10.2	103	0	272	193	5	55
Total				(Single Clips)	3,635	1				
				(Marks)	3,635	1				

Table 4. Summary of Silver Salmon Sampling Data, 1950

Area	Month	AVERAGE WEIGHT: No. Fish	AVERAGE WEIGHT: Total Weight	AVERAGE WEIGHT: Avg. Weight	MARK RATIO: No. Examined	MARK RATIO: Marks Found	No. L-F Taken	No. L-W Taken	Catch/Day: Fish	Catch/Day: Pounds
Columbia R.	June	194	952	4.9	528	0	475	34	10	49
Newport		490	2,621	5.4	490	1 BV	329	79	6	32
Coos Bay		158	926	5.9	160	0	250	84	6	33
Total				(Single Clips)	1,178	1	1,054	197		
Columbia R.	July	273	1,571	5.7	1,624	0	1,488	100	14	81
Newport		216	1,339	6.2	216	0	345		8	51
Coos Bay		464	3,367	7.3	442	1 RV	415	92	11	80
Total				(Single Clips)	2,282	1	2,248	192		
Columbia R.	August	1,053	9,408	8.9	2,114	2 RP 1 LP	1,275	65	52	420
Newport		2,437	19,185	7.9	3,291	2 BV 1 RP	311	94	59	467
Coos Bay		164	1,322	8.1	164	0	513	151	9	74
Total				(Single Clips)	5,569	6	2,099	310		

Totals			
	RP	3,008	- 1
	LP	9,024	1
	RV	9,024	1
	BV	3,008	1

Table 5. Summary of Average Weight Data, By Weeks,
Silver Salmon, 1950

WEEK	ASTORIA				NEWPORT				COOS BAY				TOTAL	
	No. Weights	Avg. Weight	Modal Lenghts	Weather and Fishing	No. Weights	Avg. Weight	Modal Lenghts	Weather and Fishing	No. Weights	Avg. Weight	Modal Lenghts	Weather and Fishing	No. Wts.	Avg. Wt.
June 15-21	114	5.1	58, 63	Clear, little wind; most botats fishing; catch per day - 12 fish.	200	5.3	60	Overcast & calm; most boats fishing South; most boats fishing for chinook; catch per day - 4 fish.	39	5.1	60, 61	Overcast, lt. wind; many boats out; catch per day about 5 fish.	353	5.2
June 22-28	53	4.9	58	Unsettled - some rough weather, few landings.	293	5.4	61, 65 58	Rough on 23-24, good weather later in week. May Many boats out. Catch/day --.	80	6.1	63	Some rough weather. Fair number of landings	447	5.5
June 29-July 5	100	4.9	60, 61	Rough weather. Fishing poor. Data partly from boats fishing Wash. coast.	8	5.9		Stormy, poor fishing.					108	5.0
July 5-11	34	5.7	61, 63	Few landings.	27	6.3	67	Calm, poor silver fishing. Most boats after chinook.	72	5.8	66 (61-7)	Calm. Mostly clear. Fishing poor.	133	5.9

Continued. (1)

Table 5 Continued. Summary of Average Weight Data, By Weeks, Silver Salmon, 1950

WEEK	ASTORIA				NEWPORT				COOS BAY				TOTAL	
	No. Weights	Avg. Weight	Modal Lenghts	Weather and Fishing	No. Weights	Avg. Weight	Modal Lenghts	Weather and Fishing	No. Weights	Avg. Weight	Modal Lenghts	Weather and Fishing	No. Wts.	Avg. Wt.
July 12-18	85	5.7	60 (59-65)	Few landings.	83	6.9	65	Stormy; few boats fishing. Small boats fishing silvers just off bar.	212	8.2	67	Good catches; light winds.	380	7.4
July 19-25	37	6.8	64, 68	Strong NW winds.				No data				Unsettled weather; not many boats out.	37	6.8
July 26-Aug. 2	31	7.1	65, 70	Rough on Aug. 1-2; calm, o'cast rest of week. Few landings	52	5.0	64, 69	Data from 3 small boats fishing off bar. One hit small fish, avg. 4.4 lb.	145	7.9	63, 67, 71	Calm; fair fishing on 29th. Poor on 27th and 1st.	228	7.2
Aug. 3-9			66	Rough early in week; calm later. Few landings.				Choppy early in week. Calm later, with good fishing.				Mostly calm. Fishing good but mostly for chinooks.		
Aug. 10-16	29	7.8	68		33	7.1	70	Stormy, a few good landings.	29	7.6	68, 72, 74	Clear, little wind. Chinook fishing good. Not many silvers.	91	7.5

Continued. (2)

Table 5 Continued. Summary of Average Weight Data, By Weeks,
Silver Salmon, 1950

WEEK	ASTORIA				NEWPORT				COOS BAY				TOTAL	
	No. Weights	Avg. Weight	Modal Lengths	Weather and Fishing	No. Weights	Avg. Weight	Modal Lengths	Weather and Fishing	No. Weights	Avg. Weight	Modal Lengths	Weather and Fishing	No. Wts.	Avg. Wt.
Aug. 17-23	596	8.8	68	Stormy on 22-23. Earlier Lt. winds. Good catches.	2,422	7.8	72, 69	Excellent fishing.	66	8.4	70, 71, 73	Clear Lt. winds. One good landings on 21. Poor earlier in week.	3,084	8.0
Aug. 24-30	419	9.2	72, 68	Stormy on 29-30 Otherwise, good weather; good fishing.				Clear and calm on 26th with good fishing. Rough on 27th.	23	8.3	70, 71		442	9.1

Fig: 1

Average Weight of Tr[illegible] Silver [illegible] ired

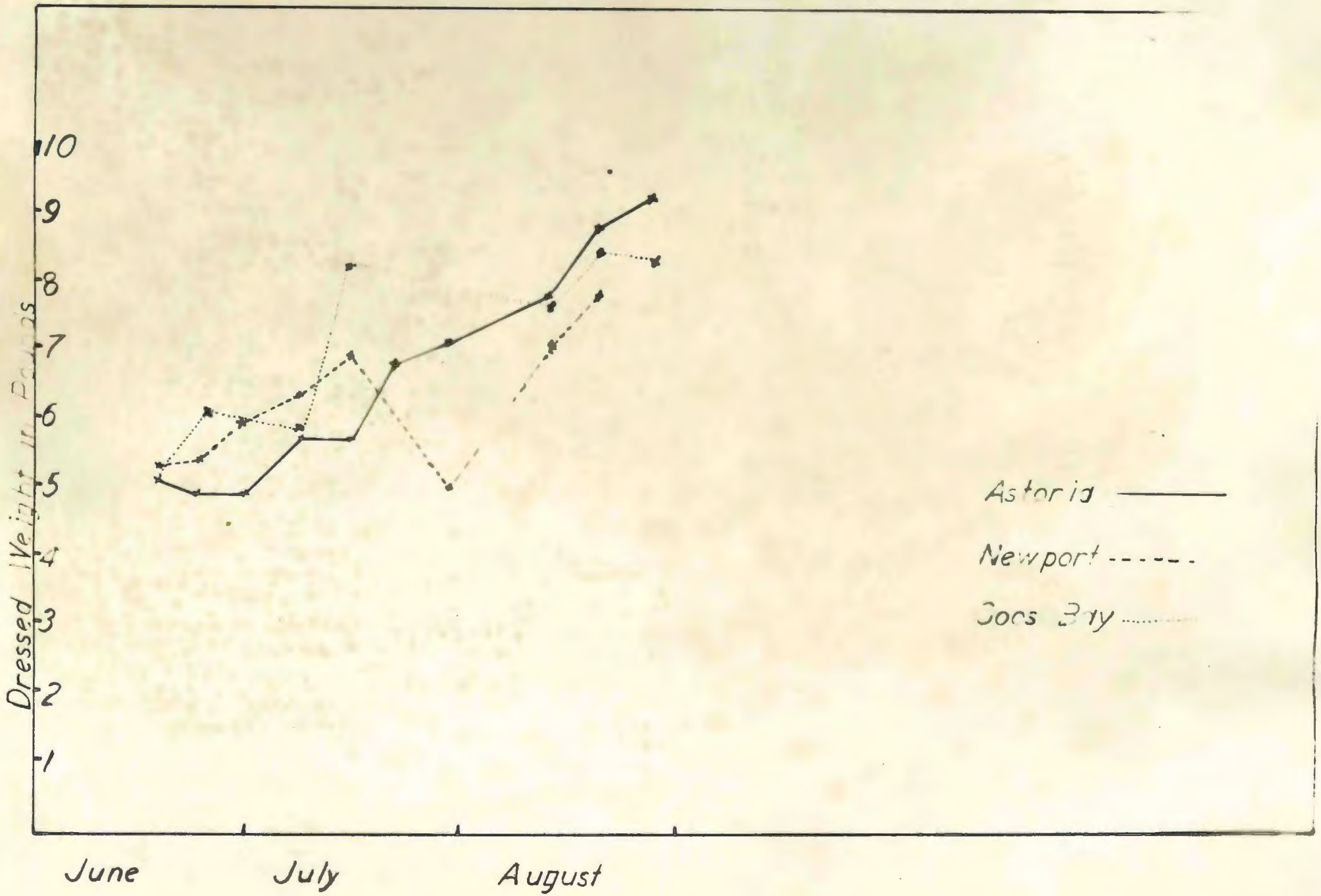


Fig. 2

Random Length Frequency of the Troll Chinook Catch

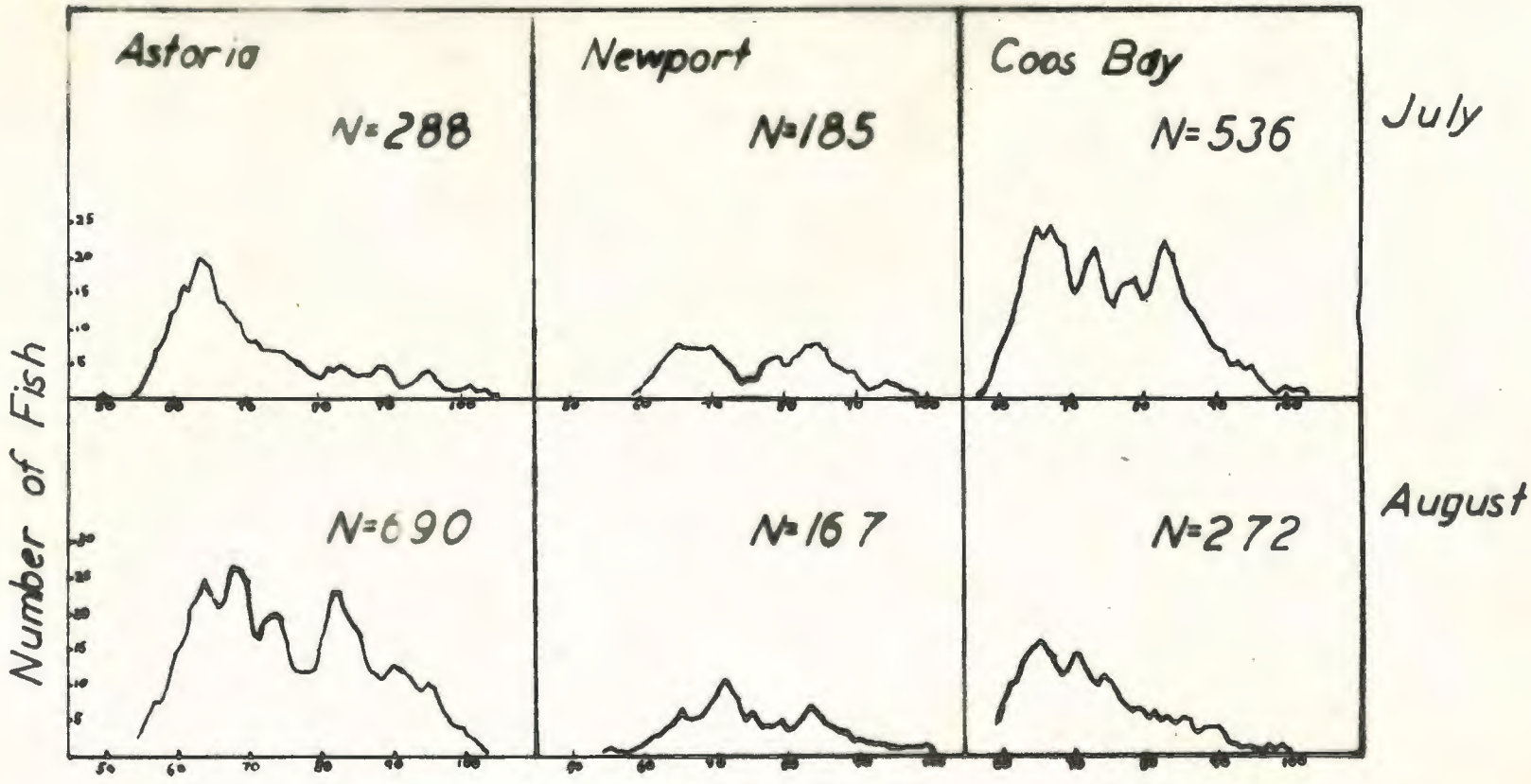
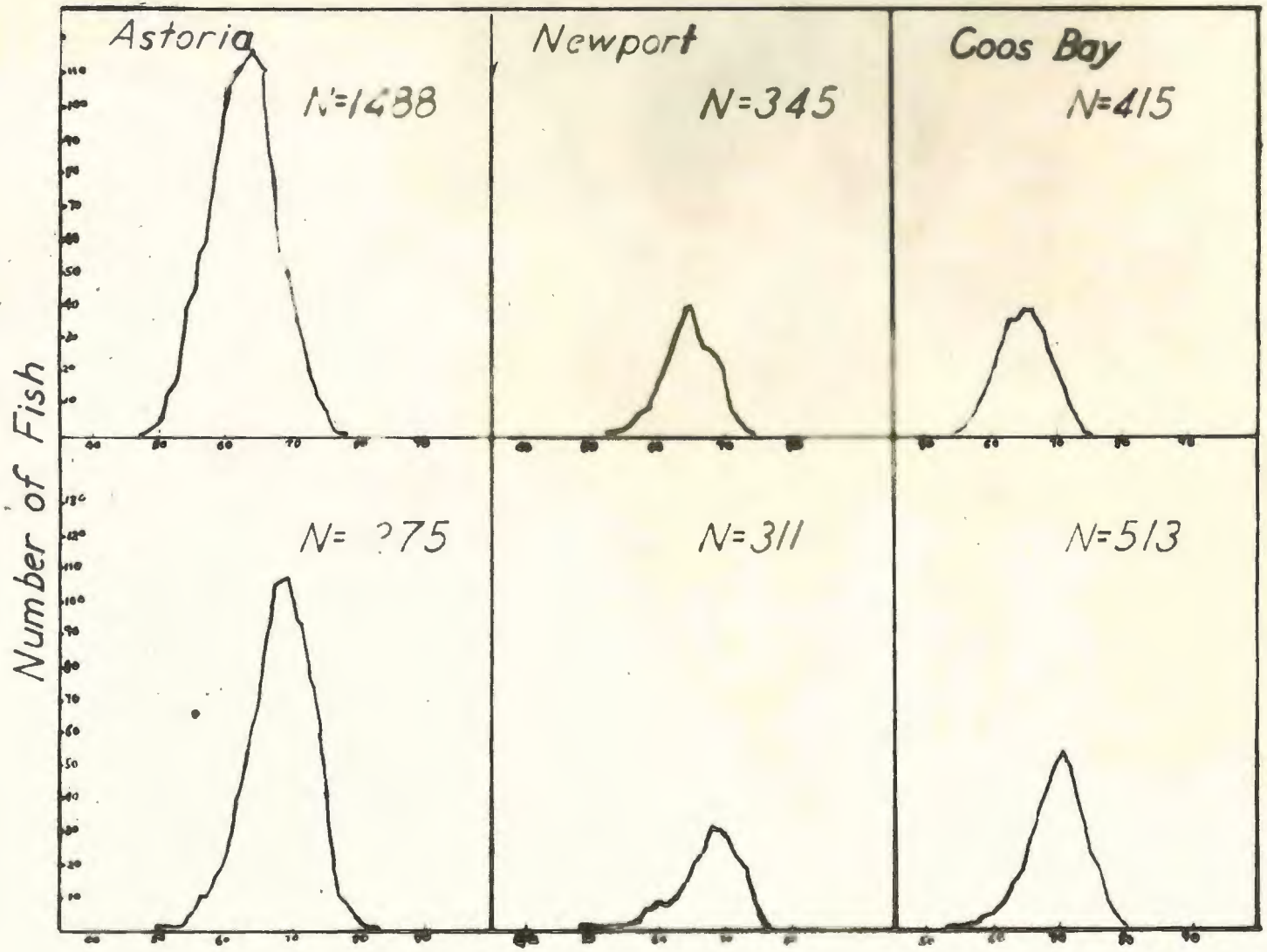


Fig. 3

Random Length Frequency of the Troll Silver Catch